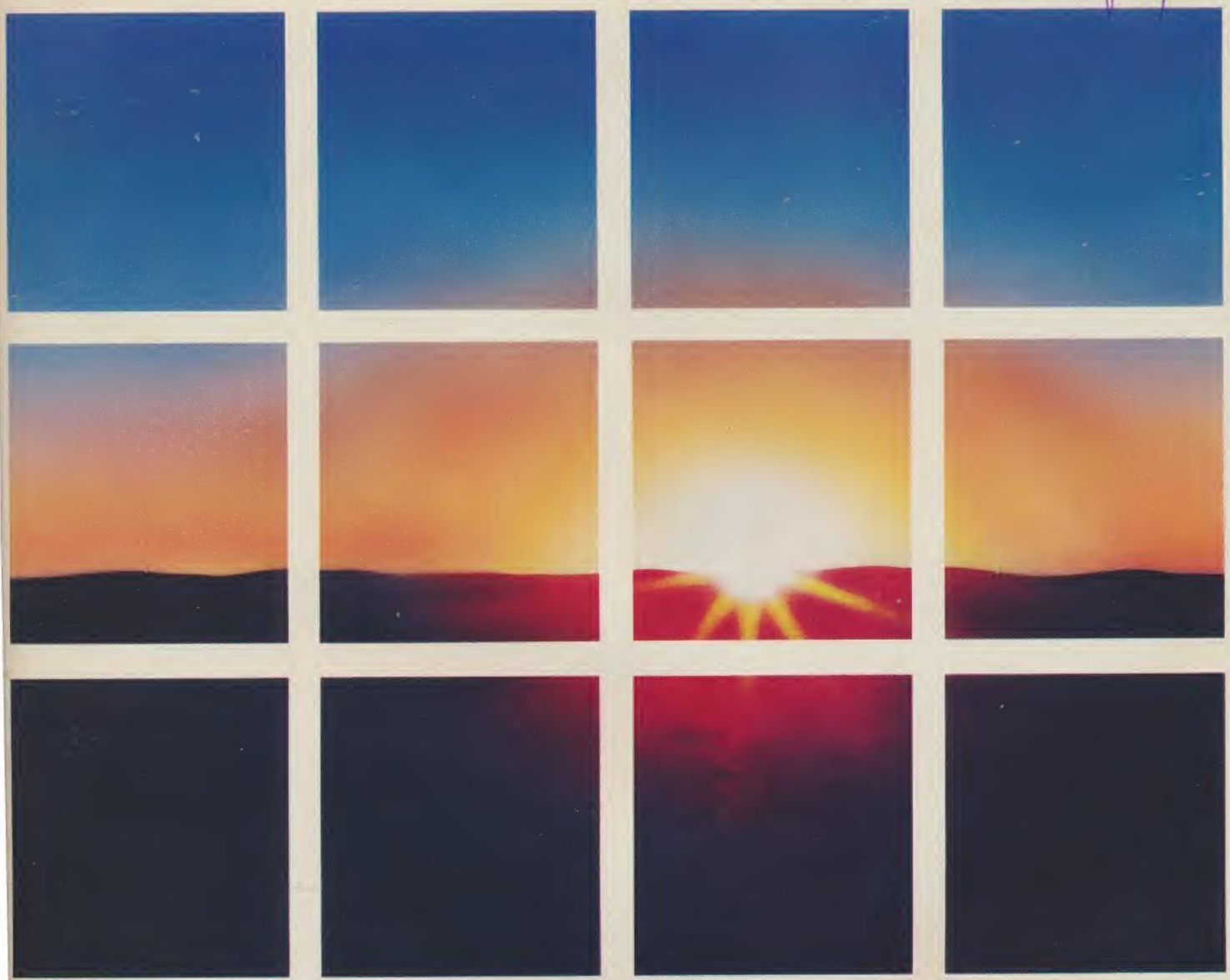
Sep '79



Edmund Scientific Catalog

1979 Fall/Winter Catalog 801/$1.00

Over 4,000 items for the hobbyist, schools and industry.

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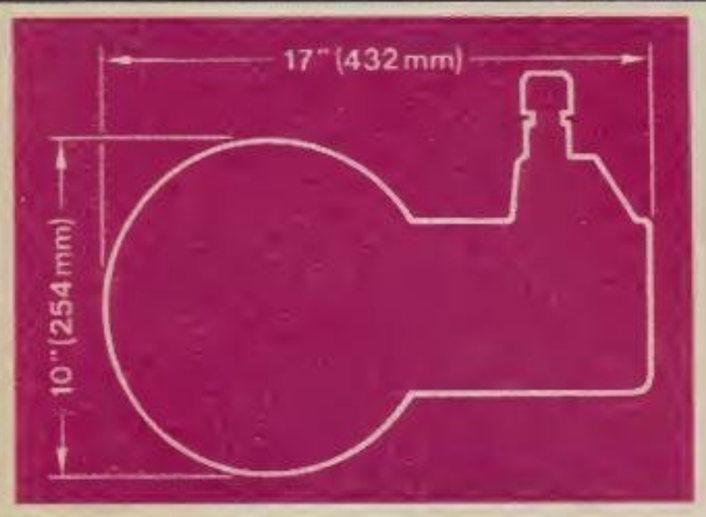
Patent No. D247,854

STUDY NATURE BY DAY . . . EXPLORE THE THRILLING WORLD OF ASTRONOMY AT NIGHT . . . WITH THE **ASTROSCAN™ 2001**

The Astroscan™ 2001 telescope is now a proven instrument. Introduced more than three years ago as the first really new beginners' telescope in decades, the Astroscan quickly became a favorite with many seasoned observers. Their reasons are the same ones you and your family will discover with the Astroscan's simplified astronomy . . . at down-to-earth prices!

Optical Precision. A telescope is only as good as its optics. The primary mirror, the heart of the Astroscan, is made in the U.S.A. in Edmund's own manufacturing facilities. This mirror affords the maximum resolution theoretically possible for its size. And, the American-made, Edmund RKE® eyepiece included with your Astroscan, incorporates a new design in eyepieces which optimizes comfort of viewing and field of view.

Wide Field. The Astroscan 2001 affords an unusually wide 3° field of view when used with the supplied 28 mm RKE® eyepiece. This wide field is the key to eliminating the most frustrating amateur experience—not being able to find sky objects easily. When you see more at one time, it's easier to find what you're looking for! The excellent balance between field of view and light-gathering power gives the viewer spectacular vistas.



Specifications

Objective Mirror:	Pyrex® base, 4¼" (108 mm) dia., 17½" (445 mm) f.l. parabolic. Aluminized, overcoated and figured to ⅛ wave.
Objective Mount:	Fixed, factory collimated for precise alignment.
Secondary Mirror:	Elliptical, minor axis, 1.5" aluminized and overcoated, figured to ⅛ wave.
Secondary Mount:	Diagonal stalk with secondary mirror is mounted directly to an anti-reflection coated optical window providing protection against moisture, dust & possible damage to optics.
Eyepiece:	1¼" O.D., 28 mm f.l. RKE® compound achromatic with smooth, positive grip, rubber roller focusing mechanism to focus 25 feet to infinity. 45° apparent field.
Magnification:	16X with furnished eyepiece. Up to 40X with optional RKE® Barlow lens.
Field of view:	3.0 degrees at 16X.
Clear Aperture:	4" (102 mm) diameter: f/4.4 effective focal ratio.
Telescope body:	Medium-impact red styrene.
Telescope type:	Newtonian richest field telescope (RFT).
Weight:	8.4 lbs. (3.8 kg) without stand. Stand wt. 2 lbs. (0.9 kg)

Specifications subject to change without notice

Portability. The Astroscan is unusually portable because it is lightweight, reasonably proportioned and tough! Optical alignment is fixed at the factory, so you do not have to readjust every time you set up. And the convenient carrying strap doubles as an adjustable sling to provide maximum hand-held stability. Just insert the eyepiece and focus! Astroscan is ready to travel with you.

Mechanical Design. Winner of an Industrial Design Award for 1976, the Astroscan has eliminated the complicated mounts typical of entry-level telescopes. Resting in its cast aluminum base, the Astroscan will easily and directly move to any position and stay there. Move it and leave it, nothing to tighten, adjust or unlock.

Aesthetics. The Astroscan's intriguing appearance and vivid colors have brought it out of the closet and onto the coffee table! Astroscan can go where you go and live where you live!

Versatility. As your interests grow, Astroscan will grow with you. Accessories are available to adapt the telescope for astrophotography, telephotography, terrestrial viewing and higher powers for detailed study.

Viewing Land Objects: With adapter, Astroscan gives you the same crisp, clear, colorful images when viewing land objects as when you are viewing the heavens.

Its a Telephoto Lens: With adapters (listed at right) and a single lens reflex camera, you can use Astroscan for astrophotography as well as terrestrial telephotography! A camera tripod bracket is also available, which allows your Astroscan to be mounted on any standard camera tripod.

Astroscan™ **No. 2001 $169.95**

Here's What Astroscan Owners Are Saying About The Astroscan 2001

"It is all too seldom these days that I am thoroughly impressed with the quality of things, but my recent purchase of one of your Astroscan 2001 telescopes has really overwhelmed me . . . Thank you for bringing me such enjoyment and restoring my faith in good old American ingenuity."

William S. Austin Architect, a.i.a.

NEW 1 YEAR LIMITED WARRANTY

Accessories For More Flexibility

A. New Improved—Astroscan Tote Bag: This sturdy water-resistant nylon bag is designed to carry your Astroscan and protect it from dust and scrapes. In handsome red with white trim and draw string closure, it measures approx. 24" deep x 16" wide.
No. 42,698 $14.95

B. Tripod Bracket: The lightweight aluminum bracket attaches to your Astroscan and mounts to a camera tripod equipped with standard ¼-20 screw thread.
No. 72,314 $19.95

C. Straight-Through Image Erector: Specially designed for Astroscan, it uses a roof prism that lets you see land objects right-side up and correctly oriented left to right. Installs easily in the eyepiece focusing tube.
No. 2007 $49.95

D. 15 mm RKE® Eyepiece: American made eyepiece nearly doubles the power of your Astroscan 2001 (also see Barlow Lens below). Custom design outperforms higher priced eyepieces. See page 11 for complete description. **No. 30,819 $29.50**

E. Barlow Lens/Photography Adapter Kit: Now available to more than double your Astroscan's power. Three kits available. No. 61,224 (shown) features T-mount to 1¼" focusing mount adapter for SLR photography. **For details on kits see pages 11 & 16.**
No. 61,224 $54.95

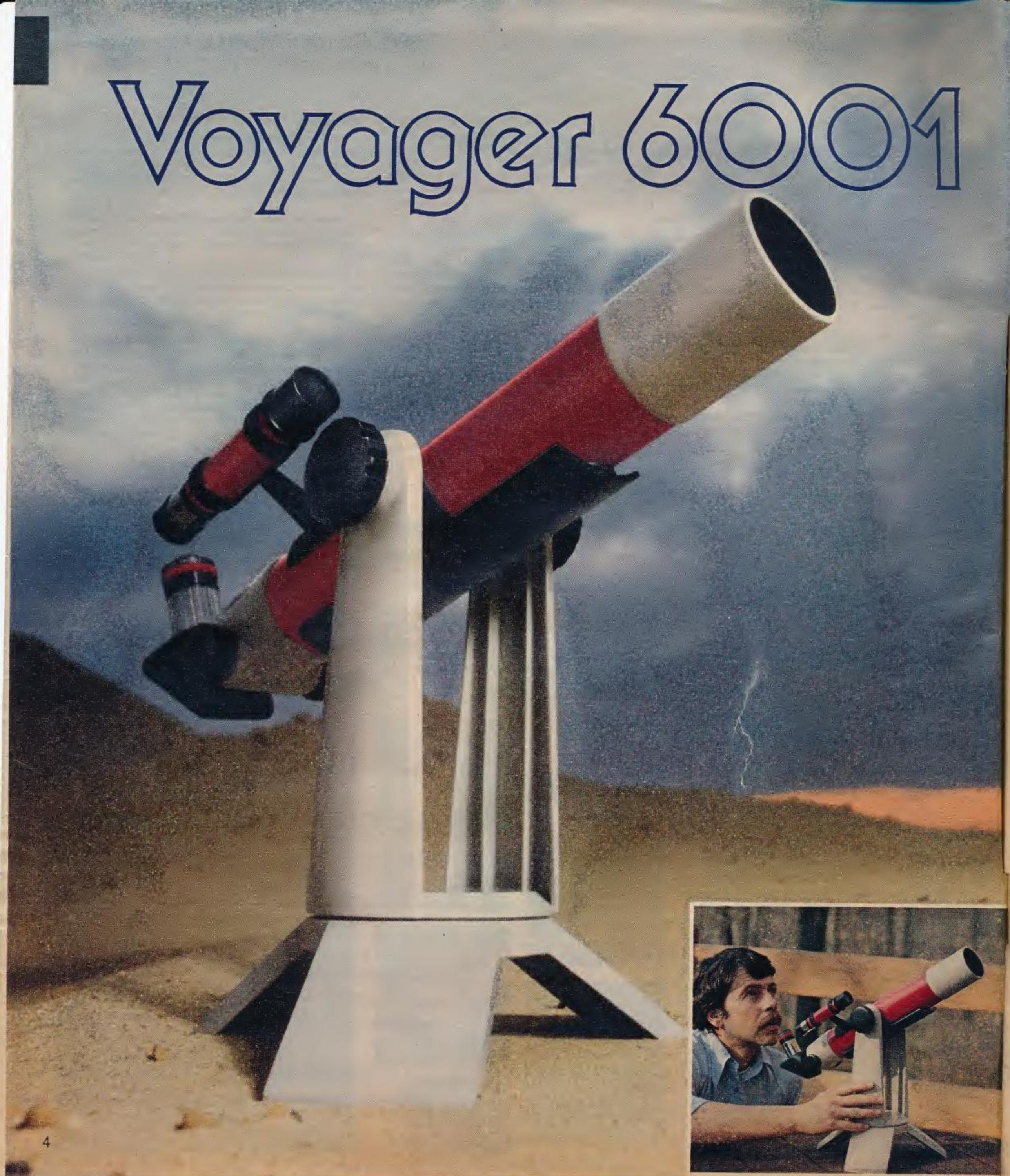
F. Replacement Rubber Eyepiece Eyeguard: (Now standard equipment w/your Astroscan) Stretches easily over Astroscan's standard 28 mm RKE® eyepiece. It cuts off annoying ambient light & positions the eye at a comfortable distance from the eyepiece. 1⅛" I.D.; 1¼" high. **No. 60,100 $1.95**

G. Dustcover for Astroscan: (Now standard equipment w/your Astroscan). **No. 42,595 $1.95**

H. Rubber Mat. Anti-skid and protective, it supports your Astroscan on hood of car or any other smooth surface. 14" dia., ¼" thick. **No. 83,023 $3.95**

"Using Your Astroscan" by Richard Berry (see pg. 12)

Voyager 6001



Voyager 6001 . . .

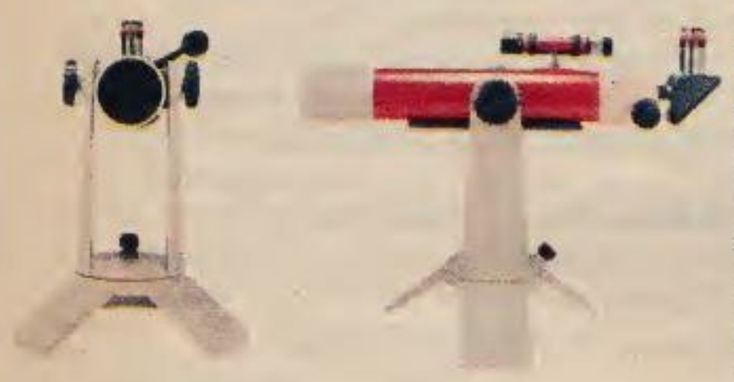
Explores Nature By Day . . . The Stars By Night

Telescopes of the past were designed for either astronomical viewing or for terrestrial use, especially refractor-type designs. Those designed for one application were largely impractical and unsuitable for the demands of another. A telescope that would truly meet the needs of those whose curiosity reaches for both the earth and the sky was simply unavailable . . . Until Now.

Edmund Scientific Company now offers you a refractor telescope that has been designed, engineered and crafted with the simplicity, precision and stylish durability that will be a pacesetter for years to come. Its superior optics and compact size make it useful for all applications . . . astronomical as well as terrestrial.

The Voyager . . . It explores in breathless detail the wonders of nature by day and the spectacular brilliance of the universe by night. It is a telescope that will let you define the limits of your own spirit of adventure.

The Voyager . . . Conceived and designed as one of the most versatile, high quality telescopes available at a price everyone can afford.



Specifications:

Objective:	*60 mm dia. f/8 achromatic lens *486 mm objective focal length *1.9 second of arc resolution *Anti-reflection coated
Eyepiece	*RKE® compound achromatic lens *15 mm effective focal length *45° apparent field *Standard 1¼" (31.8 mm) O.D. *Completely ray-traced
Power:	*32X With furnished 15 mm RKE® eyepiece *81X with optional Barlow lens
Field Of View:	*1.23 degrees at 32X
Type:	*Refractor telescope
Image Erector:	*Right angle roof prism *Standard equipment *Anti-reflection coated
5X Finder Scope:	*Cross-line reticle *Eccentric ring mount
Mount:	*Table top tripod mount *Sturdy altazimuth fork *Cradle type mount *Lightweight, cast aluminum alloy *Rubber pads on base *Can be mounted on standard ¼" x 20 thread camera tripod w/optional adapter.
Focusing Mount:	*Smooth rack and pinion focusing *1¼" I.D. will accept all standard American eyepieces and accessories *2 large focusing knobs
Dimensions:	*Height: 15½" (83.8 cm) *Weight: less than 7 lb. (3 kg.) *Tube length: 18" (44 cm)

A Terrestrial Telescope . . . The compact, streamline design of the Voyager 6001 makes it an ideal companion on nature outings through rough, wooded terrain. Crafted from durable, lightweight aluminum, it won't become heavy or burdensome on long outings. Weighing less than 7 lbs., it is rugged enough to withstand the normal punishment of hikes and nature walks. Its tabletop base gives Voyager excellent stability. The base is 12¾" high, can be set down on any flat surface and is immediately ready for use without complicated set-up procedures. If you prefer, the Voyager can be optionally adapted onto any standard camera tripod for even more versatility. The smooth, rack and pinion focusing gives you sharp images of birds and animals in just seconds. With the precision 5X 24 mm finder scope, you simply find your target, aim and focus on any subject as close as 25 feet away. Nature viewing is less complicated with Voyager. It comes equipped with an image erector so that you see everything as it was meant to be seen—right side up and correctly oriented from right to left.

An Astronomical Telescope . . . Voyager 6001 has all the basic requirements of an outstanding astronomical telescope. It has been built around a high quality 60 mm lens which was specifically designed for Voyager by Dr. David Rank, former Physics Department Chairman of the Pennsylvania State University. Voyager will bring you the clearest, brightest view of any similar size refractor telescope. Locating those hard-to-find celestial objects has been made easy with the addition of a 5X 24 mm adjustable finder scope with a cross-hair reticle. A 15 mm RKE® eyepiece completes Voyager's superior optical system. Rack and pinion positive focusing has been built into the system. To insure quality images, Voyager has been placed in a rubber-cushioned cradle so that vibrations are reduced to a minimum. For either application, Voyager promises hours of enjoyment without complicated set-ups and adjustments. The Voyager is designed to have one of the finest optical systems ever developed in a telescope of this type.

These are some of its outstanding optical features:

- **Superior Objective Lens:** Specially designed to Edmund Scientific Company specifications and manufactured by our own optical facilities, this lens insures the best possible images.
- **15 mm RKE® Eyepiece:** Standard equipment on the Voyager. . . see RKE® Eyepieces, Pg. 11.
- **Optional RKE® Eyepieces:** Increase the versatility of Voyager with the eyepieces listed below.
- **Roof Prism Image Erector:** See everything as it really is . . . as it was meant to be seen.
- **Telephoto Lens:** With the telephoto attachments available from Edmund Scientific Company, you can photograph birds, landscapes or the stars. The cradle mount reduces vibrations that could affect your pictures. In addition, the smooth, rack and pinion focusing will enable you to obtain a precise focus both quickly and easily. The Voyager represents Edmund Scientific Company's 38 years of experience and successful innovation in the field of optics and astronomy. It is the rare combination of stylish design, superior optics and exceptional durability for which you have been waiting. Order yours today and enjoy new adventures with the Voyager tomorrow.

SPECIAL INTRODUCTORY PRICE No. 6001 $249.95
Suggested Retail Price—$299.95

Voyager 6001 . . . Accessories

(A) Carrying Case **No. 6002 $49.95**

(B) 2.5X RKE® Barlow Lens Adapter: for increased magnification with any eyepiece. **No. 61,224 $54.95**

(C) Cradle Adapter for Tripod Mounting: converts the Voyager to a standard tripod mount, allowing the viewer to stand & observe at a normal height from the ground. **No. 6005 $19.95**

(D) Camera Adapter: use with your 35 mm S.L.R. camera for astrophotography. See page 27 for compatible "T" adapters. **No. 40,975 $6.95**

(E) Straight-Through Erecting Image Adapter: slips into the body of the Voyager in place of the standard 90° adapter. Great for terrestrial viewing! **No. 6004 $49.95**

(F) 8 mm RKE® Eyepiece: offers higher magnification for better viewing of details. **No. 30,820 $29.50**

(G) 28 mm RKE® Eyepiece with rubber eyeguard: offers a wider viewing field with less magnification. This eyepiece will have a slight vignetting at the periphery of the field. **No. 30,787 $29.50**

New 1 Year Limited Warranty

THE EDMUND DELUXE 3-INCH REFLECTOR

30X to 90X **$119.95**

This 3" reflecting telescope is an ideal, low-cost introductory instrument to astronomy & the wonders of the universe—an excellent "first telescope"! With it, you, your family & friends can pursue a fascinating hobby. See the rings of Saturn, Jupiter's moons, the craters of Earth's moon and many other celestial sights. A quality system designed for durability, it will give you many years of educational enjoyment. Among its outstanding features are:

- *3-inch dia., 775 mm f.l. f/10 aluminized & overcoated spherical mirror
- *28 mm RKE® eyepiece with 3X adjustable Barlow lens and tube
- *Rack & pinion focusing mount accepts standard 1¼" O.D. eyepieces & accessories
- *⅛" thick rigid PVC telescope tube
- *6X finder telescope with Ramsden eyepiece, light shade, alignment rings and cross-hair reticle for sighting
- *Cast aluminum, fixed equatorial mount with positive locking fork so you can follow a star with only one motion
- *36" hardwood tripod with metal leg braces
- *"How To Use Your Telescope" by S. Brown & "Rotating Star & Planet Locator"

Deluxe 3" Reflector **No. 80,162 $119.95**

Accessories (require No. 41,615 adapter, pg. 42)

12.5 mm f.l., 0.917" O.D. Ramsden Eyepiece: Magnification 62X. **No. 30,198 $9.95**

19 mm f.l., 0.917" O.D. Symmetrical Eyepiece: 2 coated achromats. Offers 41X. **No. 30,315 $21.50**

THE EDMUND STANDARD 3-INCH REFLECTOR

30X to 90X **ONLY $79.95**

For the budding astronomer on a budget, this low-priced model offers you quality optics as well as plenty of fun and enjoyment. It's perfect for the beginner who wants to start out inexpensively but will want to add features later. A classical Newtonian reflector telescope, it can be adapted easily to all of the accessories listed below as your interest, knowledge & budget grow. Designed to give you years of star–gazing satisfaction, it features:

- *3" dia., f/10 spherical mirror, 30" f.l.
- *30X, 0.917" O.D., 1" f.l. Ramsden eyepiece
- *Accessory Barlow lens for 90X max. mag.
- *3X finder scope
- *Durable PVC telescope tube
- *Draw tube focuser eyepiece mount
- *Fork–type equatorial mount with fixed polar axis and locking position levers
- *36" high hardwood tripod
- *"How To Use Your Telescope" booklet
- *"Rotating Star & Planet Locator" booklet

Standard Edmund 3" Reflector **No. 85,240 $79.95**

And Remember: Edmund Scientific Co. backs its telescopes with its guarantee of quality optics and prompt delivery.

Replacement 3X Barlow Lens: **No. 42,197 $8.50**

Rack & Pinion Eyepiece Focusing Mount: (for 3" Standard) Accepts 1¼" O.D. eyepieces & mounted Barlow lenses. Has 2¼" focusing travel. **No. 50,077 $23.95**

Buyers' Guide
TO TELESCOPES

The Universe Awaits You

Explore the moon, our solar system and beyond . . . through the fascinating science of astronomy.

Man has used many tools in his search for knowledge, yet only one has illuminated the silent mystery of the twinkling stars. Only the telescope has enabled man to see what is out there—the quiet, awe-inspiring beauty of the Milky Way, the mountains and craters on the moon, the amazing golden rings of Saturn—the multitude that is our universe!

Astronomy is an adventure for amateurs and professionals alike. It is fast becoming one of the most popular space–age hobbies for persons of all ages. Whether you want to build a telescope from scratch or buy one complete—we have everything you need! If you're wondering how you should enter this exciting science, look through this Buyer's Guide to Telescopes. It's the best way to begin your journey to the stars.

Perhaps you are just getting into astronomy. If so, you probably have a lot of questions, like: "What type of telescope is best?", "What about lens and mirror quality?", "How much power do I need?".

There are two basic types of astronomical telescopes: refractors and reflectors. One of the most important functions of a quality telescope is to collect as much light as possible and to focus this light to an image with as little distortion as possible. The refractor uses an objective lens to do this, while the reflector uses a mirror.

The Reflector . . . Objective Mirror Type

In a reflector, light is collected by a concave, front-surface mirror and reflected into the eyepiece by a flat diagonal mirror located near the front end of the telescope tube. The image is focused and viewed here. Inch–for–inch, the reflecting surface of a reflector is less efficient than that of a refractor. However, reflectors are also considerably less expensive to build and, for this reason, seem to be the most popular choice for beginners. The larger the primary mirror, the greater the light-gathering & resolving power of the instrument. Reflectors are also inherently color-corrected.

The Refractor . . . Objective Lens Type

The refractor telescope has an achromatic objective lens that gathers light. A primary image is formed by the objective and magnified by the eyepiece. Refractors require less adjustment than reflectors and are easier to keep clean because their tube ends are closed (the Edmund Astroscan™ 2001 has these refractor advantages). Refractors experience less loss of light in transmission than reflectors do, but they must use a two–element, four surface lens system to avoid color aberrations absent in reflectors.

Note: The purpose of the eyepiece in both the refractor and reflector is to magnify the image produced by the lens or mirror.

Field Of View

Field of view is the expanse of sky that you see through a telescope. Conventional, long focal length telescopes have relatively small fields measuring approximately 1°. Short focal length telescopes, such as the Astroscan™ 2001, have fields as wide as 3° to 4° and are often called "rich field" telescopes because they show the greatest number of stars in one view. Although "rich field" telescopes have relatively low powers, they afford the observer spectacular views of the heavens by optimizing the balance between field of view and light-gathering power. In all kinds of telescopes, the field of view decreases as magnification increases. "Rich field" telescopes are better for viewing certain deep sky objects such as nebulae.

Magnification

Most beginners think magnification is paramount. It is NOT. As a matter of fact, "high power" is not suitable for a beginner in astronomy and may frustrate his budding interest. The reason is quite simple. High magnification is synonymous with narrow field, dim image and vibration sensitivity. The narrower the field, the more difficult it is to find objects. Experienced astronomy buffs know this. That is why they use lower available powers 90% of the time!

$$\text{Magnification} = \frac{\text{f.l. Objective}}{\text{f.l. Eyepiece}}$$

Resolving Power

Resolution is the ability to reveal fine detail. It depends on the size and quality of the objective or mirror. The larger the diameter, the more clearly two closely adjacent objects such as double stars will be seen as separate distinct objects. Details of the moon and planets can be seen more distinctly.

Light Gathering Power

The larger the objective lens or mirror, the greater the light-gathering power. The greater the light-gathering power, the brighter the image. Bright images make for spectacular views. The most spectacular views are provided by "rich field" telescopes.

For a **free** copy of our new **"Buyers'/Owners' Guide To Telescopes"** (No. 9949) write to the Marketing Division.

The Edmund 4¼-Inch f/10 Telescope & The NEW 4¼-Inch f/4 Telescope

Professional Quality Features At A Low Price

"New Improved" Prompt Delivery

*Now with lightweight aluminum end rings!

*See the new 4¼-Inch f/4 below

The new Edmund 4¼–inch f/4 and 4¼–inch f/10 telescopes are ideal instruments for quality–minded beginners and serious amateurs who want professional features at a low price. Both of these quality instruments feature a completely redesigned equatorial mount and the widely acclaimed 28 mm RKE® eyepiece with rubber eyeguard. Made of sturdy phenolic fiber tubing, these telescopes **now feature aluminum end rings for rigid support.** The 4¼" aperture provides twice the light-gathering power of 3" telescopes. The new equatorial mount is made of cast-aluminum alloy for strength, stability & portability. 4¼–inch reflectors come equipped with a newly designed 115 V AC electric clock drive that tracks stars automatically.

The all new Edmund 4¼–inch f/4 offers you the additional advantages of increased portability and wide-field view. **The 4¼–inch f/4** is a rich field telescope and, by using relatively low powers, provides bright, clear images as well as remarkable clarity of celestial objects (because of its ability to gather light). The 4¼–inch f/4 can also be mounted onto a larger telescopic system for taking wide-field astrophotographs.

Both the 4¼–inch f/4 and the 4¼–inch f/10 incorporate the following outstanding features:

Focusing Mount: Smooth rack and pinion, accepts all standard 1¼" O.D. accessories.

Telescope Tube: Lightweight 5⅛" O.D. phenolic fiber tube for excellent thermal insulation with aluminum alloy end rings for rigid support. Pre-drilled for camera brackets.

Equatorial Mount: (New Edmund design) Lightweight cast aluminum alloy; large adjustment knob for lateral setting from 0–90°; adjustable slip-clutch on polar axis; lock knob on declination axis; quick release cradle lock knob for easy tube release, rotation & balance; large easy-to-read and set drum-type setting circles on both axes; quick–detach pedestal legs.

Synchronous Clock Drive: Totally enclosed design has 96–tooth, brass worm gear motion with 3.000" P.D., 115 V AC with grounded plug and adjustable friction clutch.

Added Bonuses: "How To Use Your Telescope" by S. Brown and "Rotating Star & Planet Locator".

Specifications

4¼–Inch f/4

***Primary Mirror:** Pyrex® base, 4¼" (108 mm) dia., 17½" (445 mm) f.l. paraboloidal, aluminized, overcoated and figured to ⅛ wave; end ring mirror cell has 3-point, adjustable mirror support.

***Secondary Mirror:** Elliptical with minor axis of 1.5", aluminized & overcoated, figured to ⅛ wave; supported by **patented,** tensioned, superthin (0.005") steel vanes; has full adjustment for easy collimation.

***Eyepiece:** 28 mm f.l. RKE® with standard 1¼" O.D., 45 degree apparent field. (See pg. 11).

4¼–Inch f/4 System with Clock Drive. Shpg. Wt. 33 lbs. (15 kg.)

No. 85,325 $350.00 T.C.C.

4¼–Inch f/4 Telescope (Without Mount & Clock Drive). Shpg. Wt. 6 lbs. (2.7 kg.)

No. 85,327 $199.95 T.C.C.

4¼–Inch f/10

***Primary Mirror:** 4¼" dia., f/10.6 1143 mm f.l. mirror, aluminized, overcoated & spherical, figured to ⅛ wave; mounted in 3-point adjustable cell.

***Secondary Mirror:** Elliptical with minor axis of 1.5", aluminized & overcoated, figured to ⅛ wave; supported by patented, tensioned, superthin (0.005"), steel vanes; has full adjustment for easy collimation.

***Eyepiece:** 28 mm f.l. RKE® with standard 1¼" O.D., 45 degree apparent field. (See pg. 11.)

***Finder Telescope:** New 5 x 24 refractor with 6° field, eccentric ring adjustment and focusing with cross hair reticle.

4¼–Inch f/10 System With Clock Drive. Shpg. Wt. 38 lbs. (17.2 kg.)

No. 85,307 $299.50 T.C.C.

4¼–Inch f/10 Telescope (Without Mount & Clock Drive) Shpg. Wt. 10 lbs. (7.8 kg.)

No. 85,286 $179.50 T.C.C.

Optional Eyepieces That Increase Magnification

8 mm f.l. RKE® Eyepiece: No. 30,820 $29.50 **15 mm f.l. RKE® Eyepiece: No. 30,819 $29.50**

System Magnifications

For 4¼–Inch f/4

With Supplied 28 mm RKE®	With Optional 15 mm RKE®	With Optional 8 mm RKE®
16X	30X	56X
40X*	75X*	139X*

For 4¼–Inch f/10

With Supplied 28 mm RKE®	With Optional 15 mm RKE®	With Optional 8 mm RKE®
41X	76X	143X
102X*	190X*	358X*

***Magnification with optional 2.5X Barlow. See Page 16.**

Celestial Calendar 1979-1980

Sept. 6	*Total Eclipse of Moon.*
Sept. 23	*Equinox–Autumn begins.*
Sept. 26	*Jupiter 0.3 degrees N. of Regulus.*
Oct. 21	*Orionid Meteors.*
Nov. 17	*Leonid Meteors.*
Dec. 1	*Venus becomes visible in evening sky.*
Dec. 1–20	*Mercury visible in SW before sunrise.*
Dec. 13	*Mars 2 degrees N. of Jupiter.*
Dec. 14	*Geminid Meteors.*
Dec. 22	*Solstice–Winter begins.*
Dec. 30	*Aldebaran occulted by Moon.*
Jan. 3	*Quadrantid Meteors.*
Jan. 10–31	*Mecury in S.E. after sunset.*
Feb. 24	*Jupiter nearest Earth.*
Feb. 26	*Mars nearest Earth.*
Mar. 2	*Mars 3 degrees N. of Jupiter.*
Mar. 14	*Saturn nearest Earth.*
Mar. 20	*Equinox–Spring begins.*
Apr. 22	*Lyrid Meteors.*
May 4	*Mars 0.8 degrees N. of Jupiter.*
May 9	*Venus greatest brilliancy.*
Jun. 21	*Solstice–Summer begins.*
Jun. 25	*Mars 1.7 degrees S. of Saturn.*
Aug. 12	*Perseid Meteors.*

6-Inch f/6
Reflector
on Pedestal
Mount

6-Inch f/5
Rich Field
Astrophoto
System on
Pedestal
Mount

6-Inch f/6
Reflector on
Equatorial
Fork Mount

Edmund's 6-Inch Reflector Telescopes

You Choose The Mount That Fits Your Needs

The Edmund 6–Inch f/6 Reflector Telescope

Professionally designed and engineered, the 6–inch f/6 offers superior performance that meets the demands of today's serious amateur astronomers and educational institutions alike. This precision Newtonian system has twice the light–gathering capability of the 4¼–inch and four times that of the 3–inch telescopes. The superb resolution of the 6–inch f/6 reflector will reveal stars as faint as the 12th magnitude and split double stars separated by as little as ¾ second of arc. The 3–point adjustable primary mirror cell and fully adjustable secondary mirror cell with a patented 0.005" thick rigid tension diagonal vane permit precise optical alignment for unobstructed observing and astrophotography. The entire system comes complete with detailed instructions, Edmund Scientific's booklet "Star–Checking Your Edmund Telescope", and Edmund's new 1 Year Limited Warranty. Your Edmund 6–inch f/6 telescope is compatible with Edmund's full selection of telescope accessories, including all the additional RKE® eyepieces.

Specifications:

Parabolic Primary Mirror
*f/6, 36 inch (914 mm) f.l. *Annealed Pyrex® glass
*Figured to ⅛ wave *Aluminized and overcoated
Elliptical–Shaped Secondary Mirror In A Cell
*1⅞ x 2⅝ x ⅜" *Annealed Pyrex® glass
*Figured to ⅛ wave *Aluminized and overcoated
7" O.D. Impregnated Phenolic Fiber Tube
*Thermal insulation and vibration damping
*Aluminum alloy end rings with integral mirror cells
Standard 1¼" I.D. Rack And Pinion Focusing
*2⅜" of focusing travel
7X Refractor Finder Telescope
*30 mm objective *5° field *Right angle viewer
*Mounted in two adjustable rings
28 mm RKE® Eyepiece
*Standard 1¼" O.D. *45° field of view

Edmund 6–Inch f/6 Telescope With Fork Mount Shpg. Wt. 67 lb. (30.4 kg.) **No. 3001 $499.00 T.C.C.**

Edmund 6–Inch f/6 Telescope With Pedestal Mount Shpg. Wt. 53 lb. (24.0 kg.) **No. 3011 $389.50 T.C.C.**

Edmund 6–Inch Telescope Tube Assembly Only Shpg. Wt. 25 lb. (11.3 kg.) **No. 3007 $259.50 T.C.C.**

Magnification

	28 mm	15 mm	8 mm
Without Barlow	33x	61x	114x
With Barlow	83x	152x	286x

6–Inch f/5 Rich Field Astrophoto System . . . If You Need A Faster System

This rich field telescope has been designed to provide both fast rich field astrophotography & bright wide field observation. A Newtonian system, the 6-inch f/5's precision mirrors—parabolic primary & oversized elliptical-shaped secondary—and large 2" I.D. focusing mount assure maximum light-gathering capabilities w/minimum distortion. A fine telescope for combining observation w/astrophotography, you have the option of mounting it with either the fork or standard equatorial mounts. For photographing stellar objects requiring long exposure times, the Edmund fork mount w/clock drive offers added stability & full sky accessibility. The Edmund 6-inch pedestal mount, on the other hand, is an economical alternative with an equatorial design. The 6-inch f/5 comes complete with 2" eyepiece mount, extension tube, camera adapter & instructions. Stellar astrophotography requires optional equipment such as a drive corrector & guiding telescope. See page 16 for our complete line of R.A. & Declination drive correctors.

Specifications

Primary Mirror
*f/5, 30" (762 mm) f.l. Parabola *Figured to ⅛ wave
*Annealed Pyrex® glass *Aluminized and overcoated
*Mounted in 3-point adjustable cell
Secondary Mirror
*1⅞" minor axis x 2⅝" major axis ellipse
*Figured to ⅛ wave *Annealed Pyrex® glass
*Aluminized and overcoated
Tube
*7" O.D. phenolic fiber tube
*Excellent thermal insulation and vibration damping
*Aluminum alloy end rings with integral mirror cells
2" I.D. Focusing Mount
*Helical rack and pinion focusing *2 1½" knobs
*Adapter for cameras and 1¼" eyepieces
Eyepiece
*28 mm RKE® *Completely ray-traced
*45° field of view
*Anti-reflection coated *Proprietary design
*1¼" O.D.

Edmund 6–Inch f/5 Astrophotography System w/ fork mount. Shpg. Wt. 90 lb. (40.8 kg.) **No. 3014 $569.00 T.C.C.**

Edmund 6–Inch f/5 Astrophotography System w/ pedestal mount. Shpg. Wt. 50 lb. (22.7 kg.) **No. 3012 $459.50 T.C.C.**

Edmund 6–Inch f/5 Telescope Only. Shpg. Wt. 23 lb. (10.4 kg.) **No. 3013 $329.50 T.C.C.**

Magnification

	28 mm	15 mm	8 mm
Without Barlow	27x	51x	95x
With Barlow	68x	127x	238x

The Equatorial Fork Mount Achieves A New Level Of Excellence

Many serious astrophotographers believe that a fork mount is essential for mounting their equipment without interfering with the operation of the mount. Edmund's new 6–inch equatorial fork mount offers you added strength and uncommon stability while, unhindered by the mount's base, allows full access to the sky. It comes fully equipped with clock drive. This equatorial mount is an impressive complement to Edmund's 6–inch f/6 Reflector or 6–inch f/4 Astrophotography system.

Features

Cast Aluminum Alloy Design
*Precision Machined. *Lightweight
*Low–friction bearings on both axes
Collar-Type Cradle
*Accepts tubes up to 7" O.D.
*Quick release knobs for easy telescope rotation, balancing or removal
Sturdy Equatorial Fork
*5° to 85° latitude compatibility
*Fine adjustment declination control
*Tension tripod with folding legs
Synchronous Electric Clock Drive
*115 V AC with grounded plug *Adj. friction clutch
*3" pitch dia. brass worm gear and steel worm
Molded Setting Circles
*Drum type w/built–in pointers. *Slip clutch adj.
6" Equatorial Fork Mount: Shpg. Wt. 67 lb. (30.4 kg.)
Height: 44" Tripod leg spread: 54" dia.

No. 3008 $349.50 T.C.C.

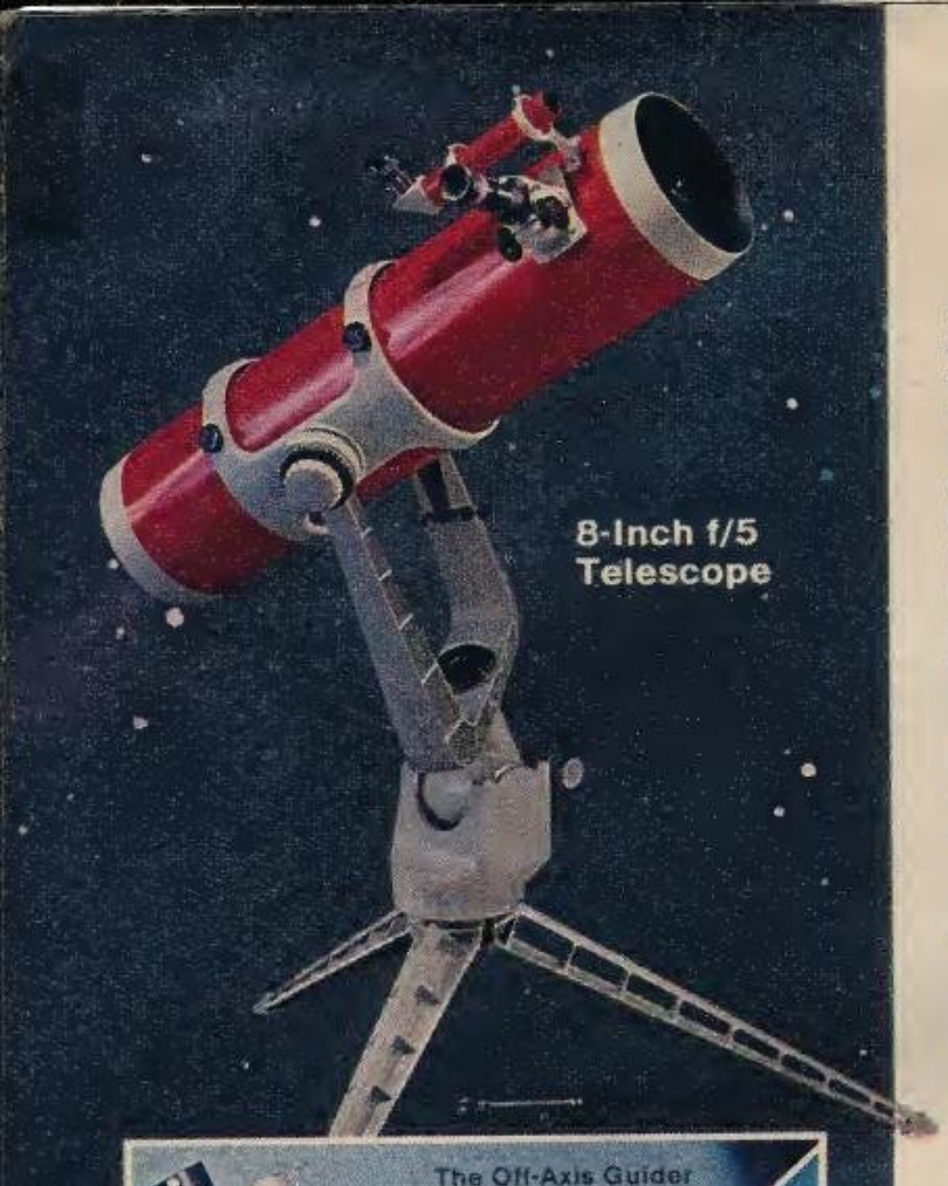
A Very Affordable Pedestal Mount With Some Very Top Quality Features

This very affordable, easy to use equatorial mount is an innovative redesign in pedestal mounts offering some very special features that virtually eliminate the traditional complexities found in other mounts, yet retain the best of the traditional virtues.

Features

Cast Aluminum Alloy Design
*Precision machined *Lightweight design (28 lb.)
*Nylon bearings in both axes
New Tension Strap Cradle
*Single knob adjustment for rotation and removal of tube *Accepts tubes up to 7" O.D.
Precision Equatorial Mount
*0° to 90° latitude compatibility
*Easily converts to altazimuth
*Control knob for Right Ascension and Declination
*Built–in adjustable setting circles
*6½ lb. counterweights
Synchronous Electric Clock Drive
*115 V AC with grounded plug
*Friction clutch adjustment knob
*3" P.D. brass worm gear and steel worm
25½" High Steel Pedestal
*Strong, stable, sets up easily
*Cast aluminum legs attach with knobs
*Leg span dia. 37"

Pedestal Mount With Clock Drive Shpg. Wt. 28 lbs. (12.7 kg.) **No. 85,309 $159.50 T.C.C.**



The Unique Edmund 8-Inch f/5 Telescope

A TRULY PROFESSIONAL TELESCOPE!

A product of Edmund's 38 year commitment to Astronomy, the 8–inch f/5 incorporates features that professional & amateur astronomers told us they wanted in a quality instrument. We listened. The Edmund 8–inch f/5 was designed & built to be a beautiful, smoothly functional telescope offering exceptional views from rich field to diffraction limited–high resolution. A precision Newtonian system, it minimizes the optical aberrations common to compound optical systems. Ideal for prime focus astrophotography, the 8–inch f/5 significantly reduces exposure times for deep–sky objects compared to 8–inch f/10 systems.

Easy to transport & store, the system weighs only 70 lbs. Its sturdy phenolic fiber tube provides thermal insulation along the optical path & has aluminum end rings for added primary & secondary mirror support. Low friction bearings provide smooth, precise motion on R.A. & Declination axes. A versatile system, it's fully supported by Edmund's large selection of telescope accessories, including an off-axis guiding system for prime focus astrophotography (see below & pg. 16).

Complete 8–inch f/5 System. Shpg. Wt. 98 lbs. (44.4 kg.) **No. 4001 $799.00 T.C.C.**

8–inch f/5 Telescope only. Incl. optics, tube finder, focus mt., eyepiece. Shpg. Wt. 30 lbs. (13.6 kg.) **No. 4002 $425.00 T.C.C.**

Tripod Yoke Mount Only. Incl. Clock Drive. Accepts 9½" dia. telescope tubes. Shpg. Wt. 68 lbs. (30.8 kg.) **No. 4003 $449.00 T.C.C.**

See our Off–Axis Guiding System below!

System Magnifications

With Supplied 28 mm RKE®	With Optional 15 mm RKE®	With Optional 8 mm RKE®
36X 90X*	68X 170X*	127X 318X*

*Magnification with optional 2.5X RKE® Barlow.

Specifications

Fast f/5 Newtonian Optics
- *Ideally suited for astrophotography
- *Visual all-purpose: rich field to high resolution

Precision Paraboloidal Primary Mirror
- *8" dia., f/5 40" (1016 mm) f.l.
- *Quality annealed Pyrex®, aluminized and overcoated for long life
- *Figured to ⅛ wave
- *Mounted in 3-point adjustable cell

Fully Adjustable Elliptical Secondary Mirror
- *2⅝ X 3 1/16 X ⅜"
- *Quality annealed Pyrex®, aluminized and overcoated
- *Figured to ⅛ wave
- *¾" dia. (1.1°) univignetted field
- *Patented 0.005" steel support vanes for minimum light obstruction

9½" O.D. Impregnated Phenolic Fiber Tube
- *Excellent thermal insulation
- *Aluminum end rings with integral mirror cells provide rigid support & precise alignnment

Unique, Foldable Equatorial Fork Mount
- *Lightweight, cast aluminum alloy
- *Rigid, stable, tension–tripod base
- *Fine adjustment declination control
- *5° to 85° latitude compatibility
- *Innovative cradle with tube quick–release knobs

Synchronous Electric Clock Drive
- *115 V AC with 3-prong grounded plug
- *Adjustable friction clutch
- *Smooth motion teflon bearings

Precision Setting Circles
- *Easy to read drum types on both axes, 3¾" dia.

9X Finder Telescope
- *1¼" dia. achromatic objective
- *6 degree field
- *Right angle viewer
- *Interchangeable eyepiece with reticle

Large 2" I.D. Helical Rack & Pinion Focusing Mount
- *1¼" I.D. adapter for standard eyepieces
- *2" O.D. to 1¼" mount adapter

28 mm RKE® Eyepiece
- *New Edmund Design
- *Standard 1¼" O.D.

Completely ray–traced optics
- *45° apparent field
- *Includes rubber eyeguard

Now You Can Obtain the important advantages of greater light grasp and higher resolving power . . . And versatility in a large aperture telescope system.

ANNOUNCING THE EDMUND 10-Inch f/6 and 12½-Inch f/6 TELESCOPES

These precision Newtonian telescopes include unique features like Edmund's patented 0.005" steel secondary mirror support vanes and aluminum end rings for rigid support. **Backed by a full range of accessories** from Edmund Scientific, now you can order a large aperture system that works for *you*—complete with the options you need. Some of the other special features of these telescopes include:

- ***Sturdy phenolic impregnated fiber tube** *Two–inch eyepiece focuser**
- ***Precision paraboloidal primary mirror** figured to ⅛ wave
- ***Helical Rack & Pinion focusing.** 2" I.D. with 1¼" adapter
- ***Fully adjustable elliptical secondary mirror** figured to ⅛ wave; 3" minor axis x ⅜" thick

Rich field to high resolution, these telescopes are ideal for astrophotography. . . . Now the professional and serious amateur can obtain the important advantages of greater light grasp and higher resolving power with the standard quality features of Edmund Scientific Co.'s telescopic instruments. Look at . . . Look through the best. Write us for more information on these quality instruments or call our Customer Service Dept. Tube assemblies start at $650.00 for the 10-Inch f/6 (**No. 85,329**) and $950.00 for the 12½-Inch f/6 (**No. 85,330**). Call (209) 251-1013 for pricing, specifications & delivery information.

The Off–Axis Guider Astrophotography System

By replacing the 8–inch f/5's standard 2" I.D. focusing system with the new Off–Axis Guider, we now offer a single–instrument, "total system" for astrophotography. The Off–Axis Guider is a revolving turret, dual–focusing mount that eliminates the need for a guiding telescope. An adjustable prism assembly intercepts a portion of the telescope's primary light cone permitting direct visual guiding through a 1¼" I.D. focusing mount while simultaneously photographing objects through a primary 2" I.D. focusing mount. By rotating the turret through 360°, a guide star can be located easily within a 2° field. Made of rigid cast aluminum alloys with rack & pinion focusing mechanisms on both mounts. Telescope system includes: the Edmund 28 mm RKE® Eyepiece (1¼" O.D.), a 1¼" to 2" eyepiece adapter, 2" O.D. focus extension tube, & a camera–to–telescope adapter. Plus all of the features of the standard 8–inch f/5 telescope system.

Complete Edmund 8–Inch f/5 Astrophotography System With Off–Axis Guider (108 lbs./49 kg.) **No. 4004 $995.00 T.C.C.**

8–Inch f/5 Astrophotography Telescope Only. Incl. Off–Axis Guider (35 lbs./15.9 kg.) **No. 4005 $625.00 T.C.C.**

9½" O.D. Telescope Tube With Off–Axis Guider. Shpg. Wt. 16 lbs. (7.3 kg.) **No. 85,321 $299.50 T.C.C.**

Off–Axis Guider Only. (Fits 9½" O.D. tube) **NO. 72,428 $249.50**

The Edmund RKE® Eyepieces

A new standard in eyepiece performance at a price you can afford.

Specifications

28 mm RKE®	
Effective f.l.	28.7 mm
Eye Relief	24.5 mm
Apparent Field	45°
Field Stop Dia.	23.3 mm
Barrel O.D.	Std. 1¼" (31.8 mm)
No. 30,787	**$29.50**

15 mm RKE®	
Effective f.l.	15.0 mm
Eye Relief	13.4 mm
Apparent Field	45°
Field Stop Dia.	11.9 mm
Barrel O.D.	Std. 1¼" (31.8 mm)
No. 30,819	**$29.50**

8 mm RKE®	
Effective f.l.	8.0 mm
Eye Relief	8.2 mm
Apparent Field	45°
Field Stop Dia.	6.6 mm
Barrel O.D.	Std. 1¼" (31.8 mm)
No. 30,820	**$29.50**

Edmund's optical engineering laboratories have achieved a breakthrough in eyepiece design and pricing—The RKE® Eyepieces.

Rarely has innovation been so sucessfully applied as in the development of this new line of high performance, moderately priced eyepieces. We wanted to *exceed* the performance of widely used American and foreign-made eyepieces costing up to twice as much. We did.

By utilizing computer analyses and full ray traces of all aberrations applied to glasses of high refractive index, we were able to develop these unique, 3–element systems which equal or exceed the performance of designs using 4, 5 and more optical elements!

Formulated by Dr. David H. Rank, former Physics Dept. Chairman of the Pennsylvania State Univ. and recipient of the Ives Medal, these Rank–Edmund eyepieces project the sharply focused images over the entire field of view. Housed in black anodized aluminum cells and barrels, each has a field stop set precisely at the focal plane giving a sharp border to the field. Each RKE® features a red rubber ring providing easy identification and sure grip in the dark. A rubber eyeguard is now included with the 28 mm RKE® eyepiece.

Available in three focal lengths, the Edmund RKE®'s provide maximum versatility to your telescope. Made in our own optical laboratories, they utilize the finest optical glasses and anti-reflection coatings. We are proud to offer you these eyepieces.

Edmund 2.5X RKE® Barlow Lens

*Designed to increase the magnification of telescope systems using standard 1¼" focusing mounts & eyepieces.

This new Barlow is computer ray–traced to eliminate aberrations, anti–reflection coated and fully color–corrected. Featuring one–piece construction, the Edmund RKE® Barlow eliminates the need for hard–to–use, short focal length eyepieces or long, cumbersome telescope tubes. **No. 61,186 $43.95**

Edmund RKE® Barlow Photography Adapter Kit

This new kit features the RKE® Barlow Lens, a T-mount to 1¼" focusing mount adapter for prime focus SLR photography & a focus locking collar.

No. 61,224 $54.95

Specifications

Magnification:	2.5X, fixed position
Optics:	2–element, color–corrected, coated negative lens, –109 mm f.l. high density glass
Tube:	Black anodized aluminum finely grooved along optical path to eliminate reflected light.
Compatibility:	Fits 1¼" I.D. focusing tubes; accepts 1¼" O.D. eyepieces; parfocal with RKE® Eyepieces.
Length:	7" overall

Edmund's Own Wide–Angle Erfle Eyepiece

Perfect for large systems, such as the Edmund 8–inch f/5, using 2" I.D. focusing mounts, this giant Erfle eyepiece provides a wide apparent field of 68° 0.32 mm f.l., it is mounted in a 2" O.D. barrel. **No. 41,347 $89.95**

Extension Tube Accepts Wide–Angle Erfle. For use when focusing tube doesn't move far enough. Provides 4" extension. One end fits 2" I.D. focuser; other end accepts large Erfle eyepiece. Incl. lock screw. Inside threaded and black finished to greatly reduce stray light reflections. Black anodized alum. **No. 61,242 $26.95**

The Edmund RKE® Breakthrough:

A new standard in eyepiece performance at a price you can afford.

Only $29.50 Each

American Made of the Highest Quality Materials in Our Own Optical Facilities!
Hand-Crafted to Precise Specifications.

"As one who wouldn't buy anything but Orthoscopics a year ago, I write this now to let people know that finally, you don't have to purchase a Cadillac-type brand name to get superior quality. Edmund's RKE® series is superior."

Terry Stewart Ashton
Salt Lake Astronomical Society

"The RKE® Eyepiece yields incredibly good definition over the entire field of view, it outperforms eyepieces costing twice as much."

Terence Dickinson, noted astronomy author.

(A) Earth In Space Globes. Transparent, 3–color acrylic globes offer the latest advances in classroom celestial spheres. The "Earth In Space" globes include dawn & dusk limitation disc, instant geographic location pointer, adjustable internal horizon ring, cradle base with compass & user's manual. Each displays 1100 stars to 4.5 mag., nebulae, clusters, constellations & more. Wt. 16 lb. (7.3 kg.)

16″ Globe	**No. 85279**	**$185.00 TCC**
Large 20″ Globe (shown)	**No. 85278**	**240.00 TCC**

(B) 12″ Celestial Globe. Accurately locate 1200 stars from first to fourth magnitude! Shows constellations, star clusters, new stars, double stars, and the Milky Way. Includes illustrated handbook.

No. 80,300 $21.98

(C) "The Great Sundial Cutout Book" by R. Adzema & M. Jones. Explore the amazing phenomenon of nature's clock, the sun, with 14 different sturdy paper sundials you cut out. Easy to assemble, fun and informative. Re–create the timepieces of the ancient Greeks, Romans, and Chinese, as well as modern variations. Fully illustrated with 100 photographs and drawings.

No. 9573 $9.95

(D) Find Sky Objects Easily With Setting Circles. Set of 2 easy–to–read black phenolic setting circles with white divisions and numbers. Declination circle measures 3⅞″ dia., 5/16″ dia. center hole. Right ascension circle measures 4¼″ dia., ⅛″ thick, 3/16″ dia. center hole.

No. P-42,821 $17.95

"Using Your Astroscan" by Richard Berry
A superbly written, richly illustrated companion for the Astroscan owner and user. Richard Berry, noted astronomy author and editor of "Astronomy" magazine was commissioned by Edmund Scientific to write this companion to the Astroscan. It's much more than an operating manual. In addition to offering excellent pointers for performing basic sighting and focusing operations with your Astroscan, it details an exciting assortment of terrestrial, astronomical and astrophotographic uses. Tells you how to use your Astroscan for bird watching, nature study, watching sporting events, and as a super telephoto lens. Provides detailed astronomical applications and guidelines on the moon and planets, and how to observe them; observing double stars, star clusters, and galaxies; finding difficult sky objects; and much, much more. **No. 9585 $2.95**

(E) 12″ Moon Globe. Developed under auspices of NASA. Strikingly 3–dimensional in appearance, it shows craters, seas, and mountains in detail; also the first Apollo landing site. Comes with handbook and interesting study projects. **No. 80,299 $19.98**

(F) "The Cambridge Encyclopedia Of Astronomy". A broad survey of astronomy with emphasis on exciting new findings. Outstanding photos from NASA space missions, new astronomical photographs from leading observatories, & color diagrams drawn especially for this book. This 495 pp. masterpiece contains 14 pages of sky maps, descriptive sections on planets, the sun, stars, galaxies, life in the universe and the latest data on binary stars, neutron stars and black holes. Hardcover.

No. 9563 $35.00

(G) "Skalnate Pleso Atlas Of The Heavens" by A. Becvar. This famous atlas has more than 35,000 celestial objects in 16 color–keyed charts, transparent grid overlay, graded star symbols to indicate magnitude and full instr. Each chart opens to 25″x16½″.

No. 9574 $14.00

(H) "All About Telescopes" by S. Brown
A well illustrated, easily understood book about telescopes and astronomy. Whether you're a beginner looking for information & guidance about the telescope you should buy or build, or an advanced amateur seeking help in ray tracing or object–image sizing, this book is for you. Teachers use it as a step–by–step text for various grade levels. Complex concepts are explained in familiar terms and every important topic is carefully examined—from grinding to optical design and focal length determination. 192 pp.

Quality Paperbound Edition	**No. 9094**	**$8.5**
Casebound Library Edition	**No. 9385**	**19.9**

(I) Find Those Astronomical Objects Easily With The New "Edmund Sky Guide" by T. Dickinson and S. Brown. Makes finding your way a simple step–by–step procedure. T. Dickinson & S. Brown, two noted astronomy writers, collaborated on "The Edmund Sky Guide" to produce the perfect companion to the "Edmund Mag 5 Star Atlas". Ideal for exploring the night sky with the unaided eye, telescope, or binoculars. 36 pages of simplified maps, tables, diagrams and text. Paperbound.

No. 9535 $3.5

(J) Explore The Heavens With "The Edmund Mag 5 Star Atlas". An indispensable companion to the above, this atlas lists all the stars to magnitude 5.0 down to 60° south declination. The chart's scale is a convenient ⅛″ per degree so you can measure eyepiece fields with an ordinary ruler. Lists of selected celestial objects are included along with many informative pages on such topics as basic astronomy, star identification, observing hints and viewing the moon. Complete with a Constellation Index, Moon Map, sinusoidal projection maps and star lists. 36 pp. Paperbound. **No. 9118 $3.5**

"Burnham's Celestial Handbooks". An observer's guide to the universe beyond the solar system in 3 complete volumes. Volume I introduces the constellations & has 102 pp. of introductory material providing the beginner with enough background to understand all of the text that follows. Volume II covers Chamaeleon to Orion; Volume III details the remaining constellations. Constellation descriptions include photographs, exhaustive tables & charts, mythological background and other legends, literary references & more. Superbly illustrated & completely readable!

Volume I	Paperbound	**No. 9568**	**$8.9**
Volume II	Paperbound	**No. 9569**	**8.9**
Volume III	Paperbound	**No. 9570**	**8.9**
Burnham's 3 Volume Set.		**No. 9581**	**24.0**

(K) "U.S. Observatories: A Directory & Travel Guide" by H. T. Kirby–Smith. Illustrated hardcover book on the history, equipment, research & visitor accessibility to U.S. observatories. **No. 9544 $11.9**

L) **"Amateur Telescope Making"** Books I, II, III. classic series of 3 hardcover books. Each illustrated, nd edited by A. G. Ingalls.

ook I: Telescope making including mirror grinding and sting. 510 pp. **No. 9208 $8.00**

ook II: Advanced information on optical construction, sting, refracting telescope objectives, and observing. 50 pp. **No. 9209 $9.00**

ook III: Covers spectrographs, diffraction gratings, ull test, optical flats, lenses for astrophotography, and ore. 646 pp. **No. 9224 $10.00**

omplete 3 Volume Set **No. P-9138 25.00**

M) **"How To Use Your Telescope"** by S. Brown. opics include observing planets, finding sky objects, strophotography, power, selection of telescope, every- ing you need to know to use your telescope. 36 pp. **No. 9055 $1.75**

N) **"Time In Astronomy"** by S. Brown. Covers solar me, sidereal time, position of stars, and much more. lso gives equatorial star chart, list of brightest stars, nd tables. 36 pp. **No. 9054 $1.50**

Star Checking Your Edmund Telescope" by J. Mullan- y. An 8–page booklet that provides excellent stan- ards for checking all telescopes. **No. 9540 $.50**

Celestial Objects For Common Telescopes". An illus- ated two volume set by T. W. Webb, revised by M. W. layall, shows what to look for, how and where. Vol. I 55 pp.) covers the entire solar system, with the excep- on of Pluto and asteroids. Vol. II is a classic reference celestial objects for moderate size telescopes. aperbound. **No. 9349 $8.00**

Radio Astronomy For The Amateur" by D. Heiserman. or the electronics experimenter. Includes a basic intro. radio astronomy and shows applications of radio as- onomy. Illus. Hardcover. **No. 9509 $8.95**

Beyond The Known Universe—From Dwarf Stars to uasars". By I. M. Levitt, Director Emeritus of Fels lanetarium. Discusses the evolution of stars, white warfs, black holes, and more. Hardcover. **No. 9495 $10.00**

Deep Sky Objects"
ack Newton's guide for amateur astronomers has 75 ull-page photos taken with a 12.5" telescope. Scale is he same for easy comparisons. Over 50 two–color nder charts. Hardcover. **No. 9561 $11.95**

0) **"Mounting Your Telescope"** by S. Brown. Dis- usses types of mounts, mounting, reflectors and re- actors, setting circles, clock drives, etc. Paperbound. 6 pp. **No. 9082 $1.50**

P) **"Telescopes You Can Build"** by S. Brown. tep–by–step, illustrated instructions for 27 scopes & 0 accessories: 33X prismatic scopes; 3, 4¼, & 6" eflectors; 3" refractor. 35 pp. Paperbound. **No. 9065 $2.00**

"Homebuilt Telescopes" by S. Brown. How to make a reflector mirror accurate to a millionth of an inch. Detailed instructions on grinding: forming, smoothing and testing the curve; chamfering; polishing; telescope construction; etc. 36 pp. Paperbound. **No. 9066 $1.50**

"Telescope Optics" by S. Brown. Focal length, image –object problems, ray tracing, homemade eyepieces. Tables, diagrams. Paperbound. **No. 9074 $2.25**

(Q) **"Norton's Star Atlas ..."** by Norton and Ingils. Completely revised 16th edition. A classic, valuable reference to 9,000 stars, clusters, nebulae, etc. 116 pp., 40 pp. of star charts. Hard cover. **No. 9464 $16.95**

(R) **U.S. Navy's "Atlas Of Space".** Developed by the U. S. Naval Institute, this 50 page map of the heavens lets you chart a starry course. Includes a map of the moon. 23 photos & 22 diagrams. **No. 9347 $2.95**

(S) **"Rotating Star And Planet Locator".** Revised & improved edition by G. Lovi shows 500 stars and their location and relationships at any time. 16 page instruction book & simplified celestial drawings.
No. 9227 $1.00
Pkg. of 25 Save $5.25 **No. P-70,156 $19.75**
4 or more pkgs. of 25 **$13.00 Ea.**

"Make Star Charts" Cut and fold 25 11x17" star maps into working start charts. **No. P-9061 $1.95**

"Planet And Moon Finder". 8½" graphic working models of the solar system and lunar motion. "Planetimer" tells how & when to view the planets and their satellites & gives their precise astronomical location. "Moonfinder" shows when the moon may be seen, against what constellations, & cites location coordinates.

(T) **Moonfinder** **No. 9455 $4.25**

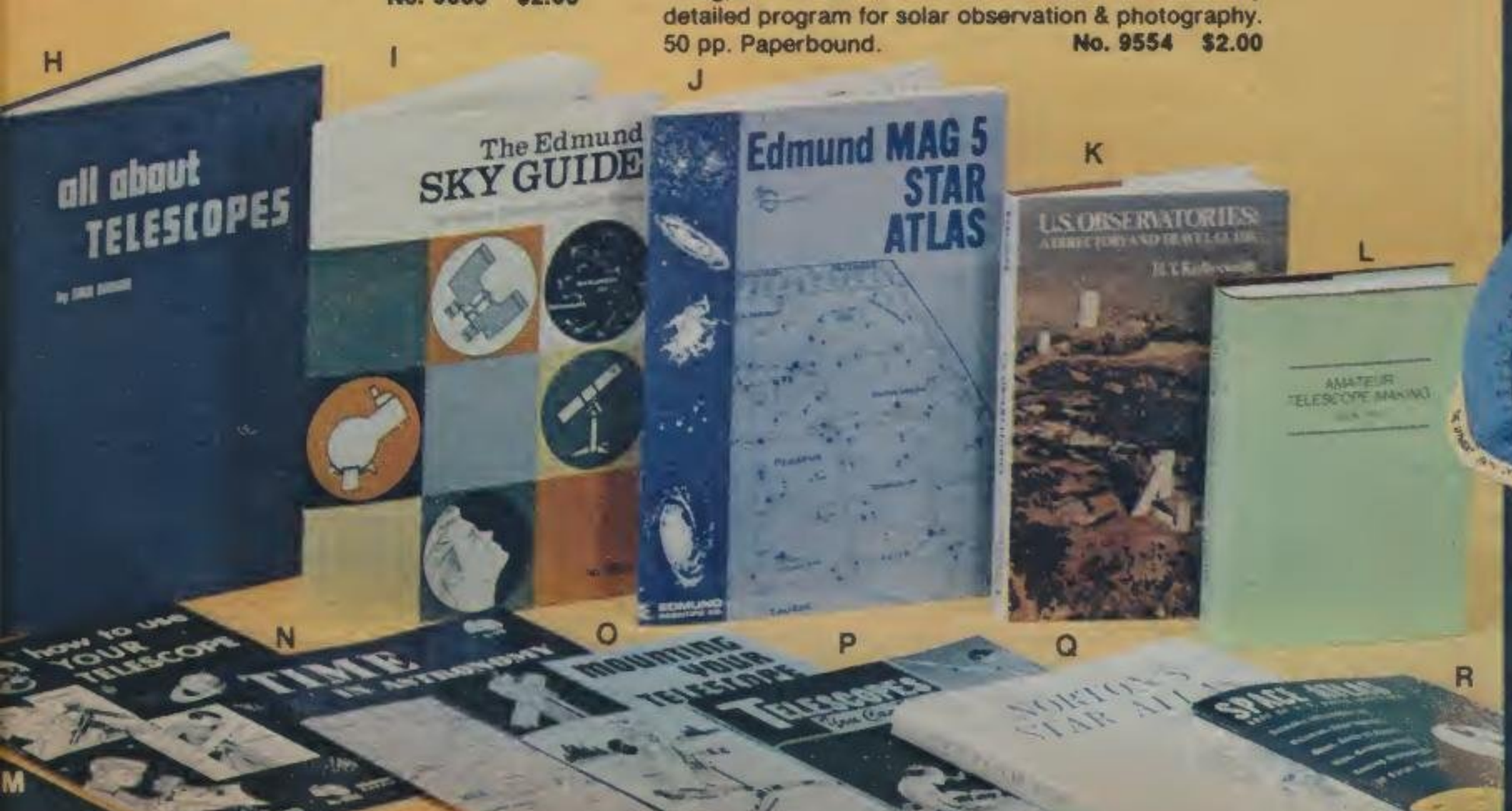
(U) **Planetimer** **No. 9454 4.25**

(V) **"The Sundicator".** Pocket-sized device shows sun's position, altitude & azimuth. Allows photographers to determine sun's angle for a given location. Introduces difference between sun & clock time. Maximum accuracy is at 40° latitude. Incl. illus. plastic case, 2 compasses, instructions. **No. 61,096 $16.50**

(W) **Two Fascinating Kits For Studying The Stars.** "Astrolabe" shows time, date, & elevation of celestial bodies. "Celestial Sphere" is the sky as seen from earth; shows celestial poles, equator, equinoxes, time differences by latitude, declination, right ascension & more. **P-61,203 $15.50**

Sundial & Sextant Kit. Build a solar clock that checks time & date and lets you plot the sun's position. Sturdy plastic/cardboard kit provides 1/10 of degree accuracy. Has front mirror. Determines latitude, star declinations & altitude. **No. P-61,204 $11.95**

"Observe And Understand The Sun" Edited by R. C. Maag, J. M. Sherlin, & R. P. Van Zandt, it offers a richly detailed program for solar observation & photography. 50 pp. Paperbound. **No. 9554 $2.00**



Edmund Astronomical Refractor Telescopes

Offering finely matched optical elements, excellent color correction and resolution, and the convenience of closed, minimum maintenance telescope systems, these Edmund astronomical refractors feature:

- **Precision,** 2–element, air–spaced achromatic objectives coated on all 4 surfaces to reduce reflection and maximize light transmission.
- **Smooth Focusing,** 1¼" I.D. rack and pinion eyepiece mounts that accept all standard eyepieces and accessories.
- **Star Diagonal** and eyepiece extension tubes for comfortable right–angle viewing of high altitude celestial objects.
- **New Equatorial Mounts:** completely redesigned medium–duty mounts featuring built–in setting circles, adjustable tension strap cradle to permit careful, easy balancing with positioning, quick release knobs on both axes and nylon bearings for smooth motion.
- **6X Finder Telescope** with achromatic 24 mm dia. objective, 2 adjustable ring mounts, spiral focusing, Ramsden eyepiece and crossline sighting reticle.
- **Sturdy,** lightweight aluminum tubes with fixed diaphragm stops.
- **Removable light shade and dew cap.**
- **Rotating "Star & Planet Locator".**

Specifications
4–Inch f/15

Resolution:
1.1 seconds of arc.
Objective
1524 mm f.l. f/15, 4–inch (102 mm) dia. achromat.
Eyepieces:
25 mm f.l., 60X Kellner, 12.5 mm f.l.; 120X Ramsden mounted Barlow lens. 1¼" dia. barrel.
Equatorial Mount:
Medium–duty, counter–balanced, fully adjustable, aluminum alloy mount with nylon bearings & sturdy, heavy–duty hardwood tripod.
Clock Drive:
Medium–duty, 115 V AC, 60 Hz., synchronous motor with grounded plug, brass main gear, steel worm gear, adjustable tension clutch.
Price:
4–Inch f/15. Shpg. Wt. 50 lbs. (22.7.kg.)
No. 85,306 $549.00 T.C.C.
4–Inch f/15. (Telescope Only). Shpg. Wt. 16 lbs. (7.3 kg.) **No. 85,331 $349.00 T.C.C.**

Specifications
3–Inch f/15

Resolution:
1.5 seconds of arc
Objective:
1143 mm f.l. f/15, 3" (76 mm) diameter achromat.
Eyepiece:
25 mm f.l., 45X Kellner, 12.5 mm f.l., 90X Ramsden; mounted Barlow lens.
Equatorial Mount:
Medium–duty, counter–balanced, fully adjustable aluminum alloy mount with nylon bearings & sturdy, heavy-duty 60" hardwood tripod.
Clock Drive:
Medium–duty, 115 V AC, 60 Hz., synchronous motor with grounded plug, brass main gear, steel worm gear, adjustable tension clutch.
Price:
3–Inch f/15. Shpg. Wt. 42 lbs. (19.1 kg.)
No. 85,304 $399.00 T.C.C.
3–Inch f/15 (Telescope Only). Shpg. Wt. 8 lbs. (3.6 kg.) **No. 85,332 $299.00 T.C.C.**

Refractor Telescope Accessories

(A) Eyepiece Mounts: Smooth, straight rack and pinion focusing with variable tension adjustment, takes standard 1¼" dia. eyepieces and accessories. Black, wrinkle–finish aluminum body, chrome-plated rack and pinion focusing tube with 4⅝" long excursion. 1¼" I.D.
For tubes 2⅞" I.D. **No. 50,103 $23.00**
For tubes 3⅞" I.D. **No. 50,108 28.95**

(B) Prism Star Diagonal . . . View High Sky Objects
For refractor telescopes that use standard 1¼" O.D. eyepieces. Useful for right angle viewing of high sky objects. Contains right angle prism chrome–plated tubes, wrinkle finish aluminum body 1" clear aperture optical path 3⅜". **No. 70,077 $31.95**

(C) Amici Prism Erecting System
Right angle viewing with erect image that's correct right–to–left. Takes standard 1¼" O.D. eyepieces.
No. 50,247 $26.95

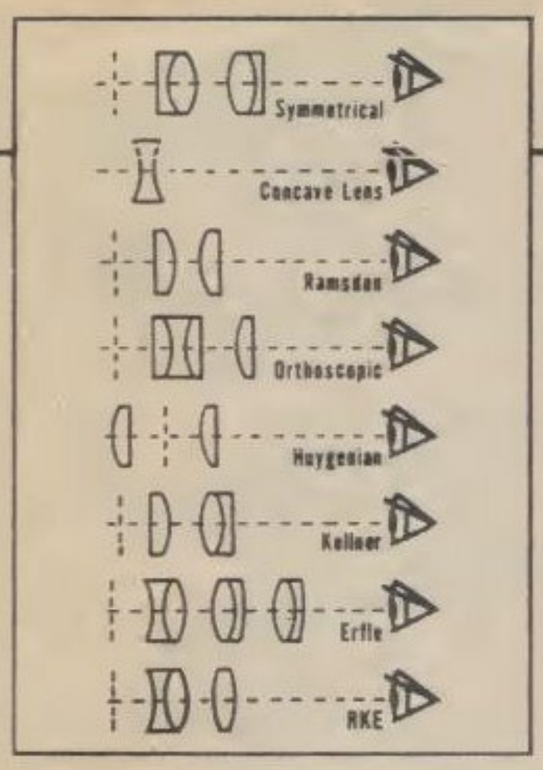
(D) Two Inch Star Diagonal
A Precision Masterpiece
Machined from a solid block of aluminum, our 2" Star Diagonal guarantees perpendicularity to within one second of arc. The custom polished mirror is figured to ⅛ wave or better. Ideal for use on catadioptric or Cassegrainian systems with enough focuser travel to accommodate a star diagonal. Equipped with cap plugs and nylon thumb screws to secure your eyepieces without scratching their barrels. Black anodized finished.
2" Star Diagonal **No. 42,774 $125.00**
Threaded adapter to fit Celestron 5" or 8" telescopes
No. 42,810 $19.95
Adapter for 1¼" eyepieces **No. 42,809 15.95**

(E) Straight Through Image Erector: Excellent for many telescopes, it uses a roof prism to permit image erection without right angle viewing. Image erector lets you see land objects right–side–up and correctly oriented, left to right. Installs easily between eyepiece focusing tube and standard 1¼" eyepieces.
No. 2007 $49.95

(F) Quality Star Spectroscope: 5 prism, 3 cylindrical lenses, and adapter for low–power orthoscopic eyepieces. Resolution power; 1 nm (separates D double line). **Not for sun and moon spectra.** Scopes with 1½" to 3" dia. objectives pick up spectra of 1 to 3 magnitude stars. Instructions. **No. 50,023 $149.95**

(G) Giant 2" I.D. Focusing Mount: Accepts wide light cone for long f.l. eyepieces & low–power, wide–angle images without restricting field of view. Go to low power with a big telescope; use short f.l., large–aperture objectives; ideal for astrophotography; 3⅞" dia. mounting flange fits standard telescope tubing (No. 85,012 pg. 20) 2¼" travel, 4 mounting holes. 3". Instructions.
(G) Focusing Mount **No. 60,769 $49.50**
(H) Standard Eyepiece Adapter For focusing mt. 2" O.D. x 1⅛. Instructions **No. 41,209 $9.50**
(I) Camera Adapter attaches 2" focusing mount to "T" adapter 1⅜ x 2¼" O.D. **No. 41,208 $11.50**

See Page 75 for air–spaced achromatic objective lenses.



Eyepiece Designs

The role of the eyepiece is to magnify the primary image of an object. The ratio of the objective's focal length to that of the eyepiece determines the power. Eyepiece design, therefore, affects magnification, image brightness, flatness of field, chromatic & other aberrations, field of view, exit pupil and eye relief. The designer is always trading one advantage for the other in an effort to optimize for specific eyepiece applications.

(1) **Symmetrical.** Two identical achromats spaced a small distance apart.

(2) **Concave Lens.** Used in Galilean telescopes. Only type that gives erect image. Good only for extremely low power. Very narrow field of view. Typical of opera glasses.

(3) **Ramsden.** Two plano–convex or double–convex lenses. Economical. Real image formed in front of field lens. 35–45° apparent field. Relatively little correction.

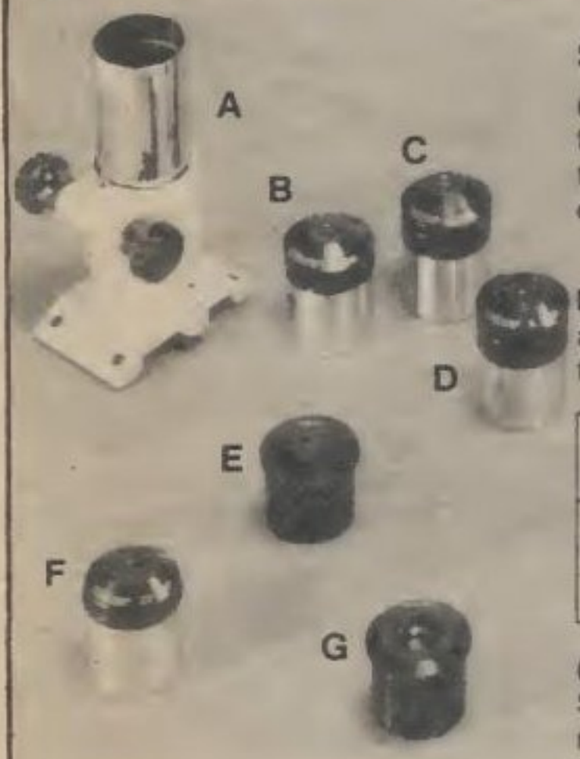
(4) **Orthoscopic.** Triplet field lens and plano-convex eye lens. Excellent color correction and wide field . . . 35–50° apparent field. Relatively expensive.

(5) **Huygenian.** Two simple lenses. Image plane falls between lenses. Better color correction than Ramsden. Typical for microscopes and inexpensive telescopes. 25–40° apparent field.

(6) **Kellner.** Most common type for astronomical telescopes. Good color correction. Excellent for refractors & longer focus instruments. 40–55° apparent field.

(7) **Erfle.** Especially designed for extra–wide field with good correction of all aberrations. 65–70° apparent field. Usually quite expensive. Comprises three achromats.

(8) **RKE®. Computer optimization of the Type II Kellner.** Provides bright wide sharp fields with excellent aberrational corrections using high index glass. 45° field. **An Edmund exclusive!**



Standard 1¼" O.D. Eyepieces and Focusing Mount

(A) 1¼" I.D. Focusing Mount. Rack & pinion; offers smooth focusing of standard 1¼" O.D. eyepieces & accessories. Features: 2¼" focusing travel, 2 focusing knobs, 4 mtg. holes & includes mounting hardware. Fits any size tube.
No. 50,077 $23.95

Kellner Eyepieces. Excellent color correction. Standard 1¼" O.D. and 50° apparent field of view. Ample eye relief. Chrome & black finish with easily visible markings.

Eyepiece	Focal Length	Eye Lens Dia.	Field Lens Dia.	Number	Price
(B)	9 mm	5 mm	7.5 mm	**60,492**	**$23.95**
(C)	12 mm	7 mm	8.0 mm	**60,493**	**$23.95**
(D)	18 mm	15 mm	19.0 mm	**60,494**	**$23.95**

(E) Ramsdens—Mounted in black anodized aluminum barrels. Standard 1¼" O.D. Give clear image at an economical price. Directions included for using short f.l. eyepieces.
No. 30,204: 6 mm f.l. $7.50, No. 30,203: 12.7 mm f.l. $8.75

(F) Complete Selection of Orthoscopic Eyepieces
***Wide Flat Field *Coated Optics *Excellent Eye Relief**
The most popular eyepieces for astronomical observing! These eyepieces offer very wide, flat field, excellent spherical & chromatic correction, greater eye relief than a Kellner and freedom from ghosts & scattered light. These have 4–element design, coated lenses and are mounted in standard 1¼" O.D. Chrome plated, brass & aluminum barrels.

Effective f.l.	Power with 48" f.l. objective	Number	Price
4 mm	300 Power	**30,364**	**$44.95**
6 mm	200 Power	**30,404**	**44.95**
12.5 mm	96 Power	**30,405**	**44.95**
18 mm	67 Power	**30,406**	**44.95**
25 mm	48 Power	**30,407**	**49.95**

(G) 19 mm f.l. Symmetrical Eyepieces. An excellent, low–cost addition to your collection. Standard 1¼" O.D. alum. cell & barrel; 16 mm clear aperture. **No. 30,316 $22.95**

Special Eyepieces

(H) 2" I.D. Helical Focusing Mount. Features adjustable gib for taking up play or backlash; will support a 35 mm camera. Uses our 2" eyepiece such as No. 41,347 on page 11. Works with any 4–12 inch dia. telescope. Includes holder for diagonal mounting rod. **No. 72,049 $89.50**

(I) "Super" 20 mm f.l. Erfle. Extremely wide 65° field of view & excellent correction of all aberrations. Provides comfortable viewing on most refractors, reflectors, RFT's & finder scopes. 1¼" O.D. chrome barrel eye lens 22 mm dia., field lens 26 mm dia. Chrome & black finish. **No. 60,495 $49.50**

(J) Kellner Zoom Eyepiece. Priced within every amateur astronomer's budget, this 7.5–22.5 mm zoom features a special anti–reflective coating & is parfocal for all magnifications. Standard Japanese dia. (0.966") can be adapted to 1¼" dia. focusers by using adapter No. 41,615 below. **No. 61,067 $49.95**

Eyepiece Adapter—converts standard Japanese 0.966" dia. eyepieces to standard 1¼" I.D. barrels. **No. 41,615 $2.95**

(K) Zoom Eyepiece. Stays in focus at all powers! Does work of 3 or 4 eyepieces—no lost refocusing time. Zoom from 8.4 to 21 mm focal length. Standard 1¼" O.D. fully orthoscopic, coated lenses give wide flat field. Excellent spherical & chromatic aberration correction. Typical magnifications for 6–inch f/6 telescope are from 58X to 145X. **No. 60,362 $69.50**

(L) The New Edmund QUIK–Change Filter Adapter. Fits between focuser & 1¼" eyepieces; extends eyepiece about 1½" out of the focuser. One drawer in the adapter accepts any Series V photographic filter, and a second accepts standard thread–in 1¼" astronomical filters such as the Edmund Dielectric Nebular Filter (Page 16). This adapter seals the optical system from stray light. Black anodized. 2⅜" long. **No. 42,803 $39.95**

Series V Photo Filter Drawer	**No. 42,805**	13.25
Thread–in Astronomical Filter Drawer	**No. 42,806**	11.95
QUIK–Change Adapter Body Only	**No. 42,804**	16.95

(M) Focusing Instrument Eyepieces. Kellner Type. Have diopter adjustments, retractable rubber eyeguards, threaded for filters and barrel is threaded externally for mounting.

Type F.L.	Ext. Thread	Int. Thread	No.	Price
6X30 21.5 mm	23X0.60 mm	20.6X.60 mm	**41,394**	**$12.95**
7X50 27 mm	29X0.60 mm	26.2X.60 mm	**41,675**	**16.95**

Adapt above to standard 1¼" O.D. Screw-on.
6X30 No. 41,614 $4.95 7X50 No. 41,741 $3.95

(N) Rubber Eyeguard. Stretches slightly to fit. 1½" dia.; 2¼" high. Cuts ambient light. **No. 60,099 $1.95**

0.966" O.D. Kellner & Orthoscopic Eyepieces. Perfect for imported 'scopes with 0.966" dia. focusing mts. Kellners give wide, flat fields with good color correction & eye relief. Orthoscopics offer the best correction at high powers. All 3 have chrome & black finished cells & barrels.

Eyepiece F.L.	Barrel O.D.	Number	Price
(O) 6 mm Ort	0.966 in.	**41,805**	**$39.95**
(P) 18 mm Kel.	0.966 in.	**41,803**	**20.95**
(Q) 25 mm Kel.	0.966 in.	**41,804**	**20.95**

(R) 30 mm f.l. Wide Angle Kellner Eyepiece. Good for rich field & satellite telescopes. Clear aperture of eye lens 1⅜", field lens 1 $^{5}/_{16}$". O.D. of brass mount 2 $^{1}/_{16}$". **No. 42,770 $12.95**

(S) Kellner Rangefinder Eyepiece—Limited Supply. Perfect for making spotting scopes, finders & adapting an eyepiece for a telescope. ⅞" f.l., approx. 50° field, mounting thread 1⅜"; focus travel $^{3}/_{16}$". **No. 50,212 $14.95**

Barlow Lenses . . .

Double Or Triple A Telescope's Power!

The negative f.l. optics of a Barlow lens increase magnification of a telescope with only a slight increase in optical path. It eliminates the need for hard-to-use, short f.l. eyepieces or long, cumbersome telescope tubes. A Barlow may also improve eyepiece performance, particularly of Huygenian & Ramsden types.

(A) Color-Corrected, 2 Element Barlow Lens—Our Lowest Priced! Position of this lens can be changed in mount to double or triple the power of your telescope. Provides increased eye relief—46.6 mm f.l. Tube mount takes 1¼" eyepieces, slides into standard 1¼" I.D. eyepiece focusing tubes. **No. 40,477 $17.95**

Unmounted Lens only **No. 30,448 8.95**

(B) Original Goodwin Barlow . . . Best For Refractors! Built to original specifications of Frank Goodwin, this achromatic Barlow fits between focuser & any standard 1¼" eyepiece. Positioning of lens within Barlow tube produces magnifications of 2 to 3 times the unaided power of your eyepiece. A proven instrument with years of experience! 4" black anodized aluminum tube. **No. 60,122 $39.95**

See pg. 11 for RKE® 2.5X Barlow

C

Edmund Off-Axis Astrophotography Guider. Eliminates need for guide telescopes. Permits simultaneous viewing & photography. **No. 72,428 $249.50**

See complete Off-Axis Guiding System on page 10.

(C) Parallax-Free Optical Sighting Telescope. Great as a finderscope for astronomical telescopes. Projects a series of lighted concentric circles onto target. Integral elevation & azimuth adjusting for final alignment. Green bright light filters flip into position. Uses "D" cell (not incl.); light level controlled by built-in rheostat. Instructions incl. **No. 71,929 $22.95**

Mounted Herschel Wedges. 5"x$\frac{3}{32}$" rod long enough for 4¼, 6 & 8" mirrors. Wedge angle 10°. Critical surface figured to ¼ wave. 40x55 mm **No. 30,266 $18.95**

Unmounted Wedge. **No. 30,265 16.95**

See page 73 for our **Resolving Power Chart.**

Dielectric Nebular Filter Blocks primary emissions of metropolitan light pollution while passing the wavelengths common to most nebulae. The Nebular Filter makes gray skies appear black, thereby brightening deep-sky images. Even in the country, the filter's suppression of omnipresent artificial light and natural airglow yields excellent nebular views that are superior for viewing and astrophotography.

(D) Type A Nebular Filter: Primarily for visual use, mounted in aluminum retainer. Threads directly into most standard 1¼" eyepieces. **No. 42,738 $64.95**

(E) Type B Nebular Filter: Mounted in ring that screws into standard "T" adapter thread. Compatible with Edmund photographic eyepiece adapters for both 1¼" and 2" mounts. **No. 42,739 $99.95**

Adapter: T thread to 1¼" I.D. used with Nebular Filter. **No. 30,878 $9.95**

(F) Variable Polarizing Filter. Manufactured exclusively for ESC! Make fine adjustments to your polarizing filters without removing the eyepiece. Set polarizer position directly & easily while viewing the image. 23 mm clear aperture, 2½" long. Black anodized finish. Fits directly between your focuser & your standard 1¼" eyepiece. A fine accessory for planetary & lunar observation. **No. 42,775 $29.95**

Adjustable Camera Support Bracket

Designed for rigid support of cameras used in astrophotography, this adjustable bracket bolts directly to your telescope. Simply bolt the bracket's base to the side of your telescope, slide in the 28¾" long rod & screw your camera to the adjustable holder. Holder has standard ¼"–20 thread to fit camera tripod socket. Lightweight aluminum. **No. 72,403 $24.95**

Camera Adapters For Telescopes

(G) Adapter's threaded end connects to "T" adapter (pg. 27) which attaches to 35 mm SLR camera. 1" long adapter tube fits into telescope focuser. Black anodized finish.

1¼" O.D. Camera Adapter for standard American telescopes. **No. 40,975 $6.95**

0.965" O.D. Camera Adapter for Japanese telescopes. **No. 41,121 $9.95**

See page 27 for **"T" Adapters** to connect above to SLR cameras, and **Reverse Adapters.**

"C" Mount Adapter. Permits 16 mm photography through your telescope. Ideal for time lapse. Thread size: 0.998 ±0.001—32". Fits standard 1¼" I.D. eyepiece mounts. **No. 42,274 $8.50**

(H) Photographic/Barlow Adapter Kit. Use with 35 mm SLR camera & "T" adapter for astrophotography. Offers you the double observing power of a Barlow lens. Fits 1¼" I.D. focusing tubes. Locking collar. **No. 2004 $24.95**

Kit w/Precision Goodwin Barlow. **No. 2005 49.95**

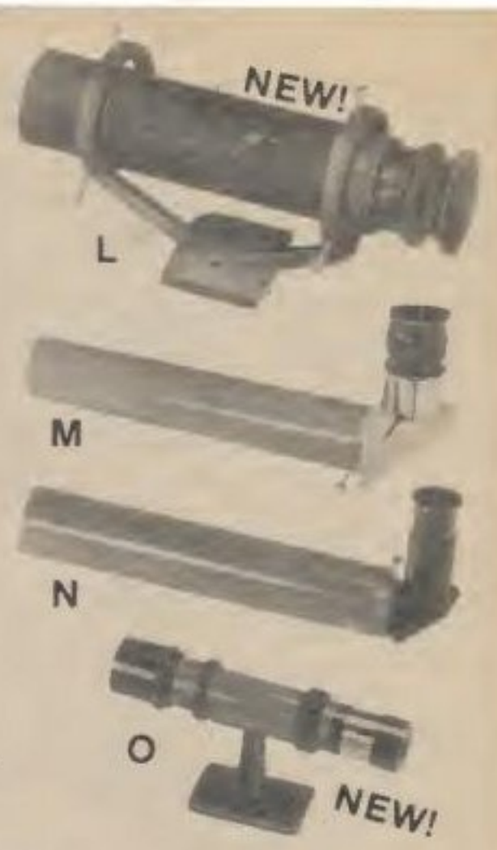
Astrophoto System Adapter Kit. See page 71.

Precision Tracking For Astrophotography With Drive Correctors

(I) Right Ascension Drive Corrector: Fast/slow push buttons on control box vary tracking rate of telescope in Right Ascension; produce precise tracking corrections during long exposures. For any telescope with synchronous motor drive up to 10 watts. Uses 12 V DC. Includes variable control for setting to solar, lunar, planetary or sidereal tracking rates. 2"x3"x4". **No. 42,814 $59.95**

(J) Dual Axis Drive Corrector: Permits precise electronic corrections simultaneously on both telescope axes. Allows dual-axis, one-hand control for your telescope through the use of a universal joystick remote controller, plus infinite combinations of R.A./Declination corrections! Attaches to Edmund fork mounts. Includes declination drive motor. Uses 115 V AC/60 Hz or 12 V DC current. **No. 42,816 $215.00**

(K) Single Axis Drive Corrector: Uses 115 V, 60 Hz or 12 V DC. Unique single axis joystick control permits variable correction rates for precise R.A. control. Variable control & instructions included. **No. 42,815 $119.95**



Finders

(L) 6X Finder Telescope With Twin Ring Mount. 50 mm. objective. Offers excellent light-gathering power. Wide Field. Red & tan. **No. 72,496 $59.95**

(M) 9X Finder Telescope w/Star Diagonal. 30 mm dia. coated achromatic objective lens. 6° field of view. 1¼" O.D. prism star diagonal for right-angle viewing. 1¼" O.D. spiral focusing eyepiece w/diopter scale. Crossline reticle, rubber eyecup. **No. 61,201 $69.95**

(N) 7X Right Angle Finder Telescope. More convenient than straight-through finders for many applications. 30 mm dia. coated achromatic objective lens. Ramsden eyepiece w/crossline reticle. Slide focusing w/locking set screw. 8" long. 1½" O.D. **No. 50,249 $39.95**

7X Finder. Same as above, but w/out right angle prism. **No. 50,080 $31.50**

(O) New Edmund 5X Finder Telescope. One piece, adjustable, cast alum., black ring mount, adjusted w/eccentric rings. Wire crosshairs in eyepiece. Screw thread focusing. Coated achromatic objective lens. 24 mm clear aperture. 5⅞" long. 1" dia. barrel. **No. 72,459 $29.95**

Finder Ring Mounts. 2" I.D. rings. Accepts No. 50,249; 50,080 & 61,201 above. Includes hardware. **No. 50,075 $12.95**

Twin Ring Finder Mount. Accepts finder telescopes up to 2¾" O.D. Single base. **No. 70,079 $19.95**

Books To Help You With Astrophotography

"Photography With Your Telescope" by Sam Brown. A "how to" manual with spacing tables, image sizes. Illustrated. 36 pp. Paperbound. **No. 9078 $2.00**

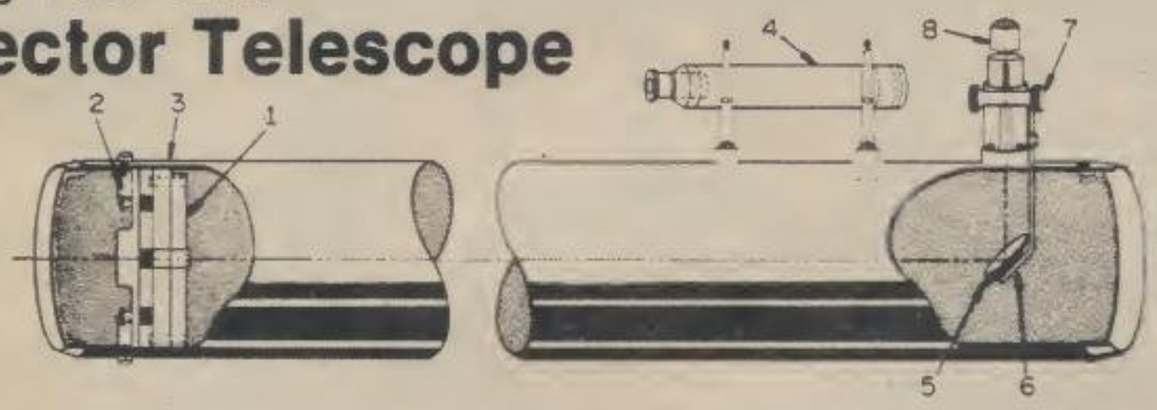
"Astrophotography Near City Lights" by Joe A. Cocozza. Discusses films, emulsions, exposures, filters, developing & other topics. 52 pp. Hardcover. **No. 9558 $12.00**

Small Diameter Eyepiece Adapters

Adapter For 1¼" Eyepiece to Japanese Telescopes. Allows use of standard eyepieces having 1¼" dia. barrels to be used with Japanese telescopes having 0.965" I.D. focusing tubes. 2" long; 1¾" O.D. Black anodized finish. **No. 30,879 $16.95**

Adapter for Japanese 0.966" O.D. Telescope Eyepieces to 1¼" Eyepieces. Use to adapt your small diameter eyepieces to standard 1¼" I.D. focusing tube. Black anodized aluminum. **No. 41,615 $2.95**

Building Your Own
Reflector Telescope



With reasonable care, you can build a reflector telescope as good as many commercial ones by buying finished materials or grinding and polishing your own mirror. A good refractor telescope with a 4" objective lens costs about $500, but you can build a reflector telescope of equal quality for substantially less money, not to mention the fun! You'll find the right kits and parts in this catalog. Start building this week!

1. **Objective Mirror:** This is the heart of your telescope, so you will want to choose it carefully. Determine the diameter of the mirror you want. Most amateurs make a 4¼" or 6" diameter mirror, though a few start with an 8". For mirror grinding kits, blanks, finished mirrors and optical kits see page 18.
2. **Mirror Mount:** This should be a rigid but easily adjustable support. You can make one of wood or metal or purchase one from our fine selection listed on page 19.
3. **Telescope Tube:** It can be cardboard, wood, phenolic, aluminum, etc., and should be painted flat black or flocked on the inside to reduce bounced light to a minimum. Its inside diameter should be considerably larger than your mirror, as shown by the examples below. See our fine selection of tubing on page 20.

Mirror Size	Tubing Inside Dia.	Mirror Size	Tubing Inside Dia.
3"	3 7/16"	6"	6⅞"
4¼"	4⅞"	8"	9¼"

4. **Finder Telescope:** Use a 3X to 8X finder to locate the object you want to observe with your high powered telescope. Make a finder with one of our many high–quality, inexpensive surplus lenses, or buy a complete one. See finder telescopes on page 16.
5. **Diagonal Mirror or Prism:** Directs image light rays from objective mirror into the eyepiece. It should be optically flat, aluminized and overcoated. Here, as with the objective mirror, the better ones are polished to ⅛ wave accuracy. They are a bit difficult to make, so you may consider buying one listed on page 19.
6. **Diagonal Mirror or Prism Mount:** We have inexpensive holders and a fine quality, adjustable holder, adaptable for 5" through 9" I.D. tubes (page 19).
7. **Eyepiece Focusing Holder:** This may be a simple sliding type or a rack and pinion focusing mount. See pages 15 and 16.
8. **Eyepieces Bring the Image to You:** Very few amateurs attempt to build their own eyepieces because optical design characteristics have a profound impact on quality. See pages 11 to 15 for more details on eyepiece types and characteristics.
9. **Tripod and Mount** (not illustrated): You can make either or both of these. We list tripods and a wide selection of mounts on page 20, as well as our booklet "Homebuilt Telescopes" (No. 9066) on page 12.

SUGGESTED PARTS LIST

PARTS:	8"		6"		4¼"		3"
	f/5	f/8	f/16	f/8	f/4	f/10	f/10
Primary Mirror	85,298	85,069	72,361	5,002	42,451	50,051	50,082
Primary Mirror Mount	72,340	70,072	72,339	50,117	50,079	50,079	50,109
Tube	85,283	85,146	85,282	85,008	80,038	85,013	85,012
Diag. Mirror	See Chart On Page 19						
Diag. Mirror Mount	72,342	50,025	72,341	60,049	61,057	61,057	61,057
Finder	61,201	50,249	50,249	50,080	50,121	50,121	
Eyepiece Holder	72,049	50,077	50,077	50,077	50,077	50,077	50,077
Mount & Pedestal	4003 or 85,134		3008 or 85,310		85,309 or 85,310		N.A.

Choose your eyepieces and accessories from our wide selection listed on the following pages. Edmund has the accessories to improve your present telescope, too.

Attention Astronomy Clubs And Schools!!!
Build Your Own Telescopes With Edmund's Low–Priced Components.
The kits below include the same quality optical elements used in our famous Astroscan™ 2001 telescope! We are pleased to be able to offer you these very reasonably priced do–it–yourself telescope kits. Pick a budget that fits your pocketbook and we will help you plan the project. Simply call our Customer Service Department. We can help save your group dollars by suggesting perfectly functioning parts having only cosmetic flaws. Many have tried it, and they tell us that it is a most rewarding experience! See pages 11 to 20 for our selection of telescope components.
Kit A: 4¼–inch f/4 paraboloidal mirror and elliptical diagonal flat-shaped mirror with 1½" minor axis.
No. 42,727 $49.95
10 or more only $39.95 each
Kit B: includes kit #A plus 1¼" eyepiece mount and a 20 mm Erfle 1¼" eyepiece.
No. 61,222 $99.95
10 or more $79.95 each.

ACCESSORIES

Optical Black and White Paint.
New velvet-finish enamels in 5 oz. cans for primed metal or wood. Black makes an excellent light absorbing surface for interiors of telescopes, cameras, other optical equipment and darkrooms. White is an excellent light reflector; use it for the exterior of your telescope.
Black No. 60,608 $7.50
White No. 60,609 7.50

Non–Reflecting Flock Paper
Pressure-sensitive, just peel off backing & apply. Ideal for lining inside of a telescope tube. Black velvet-like non-reflecting surface provides millions of light traps. In 20x30" sheets.
Single sheet No. 70,621 $ 3.95
Pkg. of 50 No. P–70,622 117.95
Non–adhesive 27x36" No. 60,068 2.95

Reflector Telescope Optics Kits with Completed Mirrors!
Make your own precision reflecting telescope with these money–saving kits. Each includes a completely finished mirror (aluminized & overcoated); front surface aluminized & coated mirror diagonal and instructions.
3" Mirror Optics Kit: Contains: 3" dia. mirror, ¼ wave, 30" f.l. and 21x30 mm diagonal. **No. 50,081 $23.95**
4¼" Mirror Optics Kit: Contains: a 4¼" mirror of Pyrex® brand sheet glass, ⅛ wave, 45" f.l. and 25x35 mm diagonal. **No. 50,074 $36.95**
6" Mirror Optics Kit: Contains: 1 parabolic mirror, 6" dia., 48" f.l., ⅛ wave, elliptical diagonal mirror (major axis: 1¾", Minor: 1¼", ⅜" thick), 1 Kellner eyepiece, 1¼" dia. barrel, 28 mm f.l. 50° field, 2 achromats in alum. mount, instructions and "Telescopes You Can Build" booklet. **No. 71,191 $108.95**
"Telescope Optics" by Sam Brown. Covers definition of optical terms, image object problems, ray–tracing, homemade eyepieces, objectives (mirrors, lenses), etc. Tables, diagrams. Paperbound 32 pp. (8½ x 11"). **No. 9074 $2.25**
For More Books On Telescope Making See Page 13.

Astronomy

An inside view of Edmund Scientific's mirror production operation

Complete Telescope Mirror Grinding and Polishing Kits . . .

Includes Mirror Blank, Tool and Abrasives.

The ultimate challenge for the amateur telescope maker is grinding his own mirror. It requires patience, but pays off in satisfaction and real savings. Each kit contains a mirror blank—recast from Pyrex® brand sheet glass which is superior in the following ways: 1.) It is the result of melting & recasting the original sheet glass and thus is double annealed. This results in fewer & smaller bubbles, if any, in the finished product; 2.) Our blanks are molded with uniform thickness, 90° edges (no taper), and 2 flat, parallel faces. This lets you choose either side for grinding and to turn the blank over if you damage the first side. Kits also include plate glass tool for grinding, first surface rectangular mirror diagonal, sighting rings, magnifying lens for inspection, 8 abrasives from coarse to fine, jeweler's rouge and tempered burgandy pitch. Detailed directions found in **"Homebuilt Telescopes"** (below).

Number	Dia. Mirror	Thick	Shpg. Wt.	Kit Price
70,003	4¼"	¾"		$ 29.75*
70,004	6"	1"		39.75*
70,005	8"	1⅜"		59.75*
70,006	10"	1¾"	30 lbs.	119.75 T.C.C.
70,007	12½"	2⅛"	46 lbs.	209.75 T.C.C.

*Includes templates

Mirror Blanks of Pyrex® Brand # 7740 Sheet Glass				Plate Glass Grinding Tools		
Dia.	Number	Thick	Price	Number	Thick	Price
4¼"	80,016	¾"	$ 9.95	80,011	⅝"	$ 6.95
6"	80,017	1"	15.95	80,012	⅝"	9.95
8"	80,009	1⅜"	29.50	80,013	¾"	14.95
10"	80,000	1¾"	59.50	80,014	⅞"	39.95
12½"	80,010	2⅛"	109.50	80,015	1⅛"	89.50

The 4¼" tools can be used as mirror blanks.
Note: Stock Nos. **80,010** (shpg. wt. 21 lbs.) and **80,015** (shpg. wt. 14 lbs.) are shipped motor freight, T.C.C.

Templates for Grinding f/8 Mirrors. Each includes sighting ring and collimating directions.
4¼" **No. 42,208** **$1.00**
6" **No. 40,316** **1.00**
8" **No. 42,209** **1.00**

Rubber Pitch Lap Mat—Time Saving Wonder
Avoid disappointing pitch breakouts when hand cutting channels. Pour melted pitch on tool, lay mat on top, then press it in with mirror to form channels. When pitch sets, an easy pull will remove the mat. In minutes you are set to polish.

Number	Size	For Mirror	Price
50,171	13½x13½"	8", 10", 12"	$7.50
60,061	6x6	4¼", 6"	3.00

Tempered Burgundy Pitch. For making pitch lap. A real trouble saver, because no resin, wax or turpentine need be added. ½ lb. container. **No. 40,023 Only $3.95**

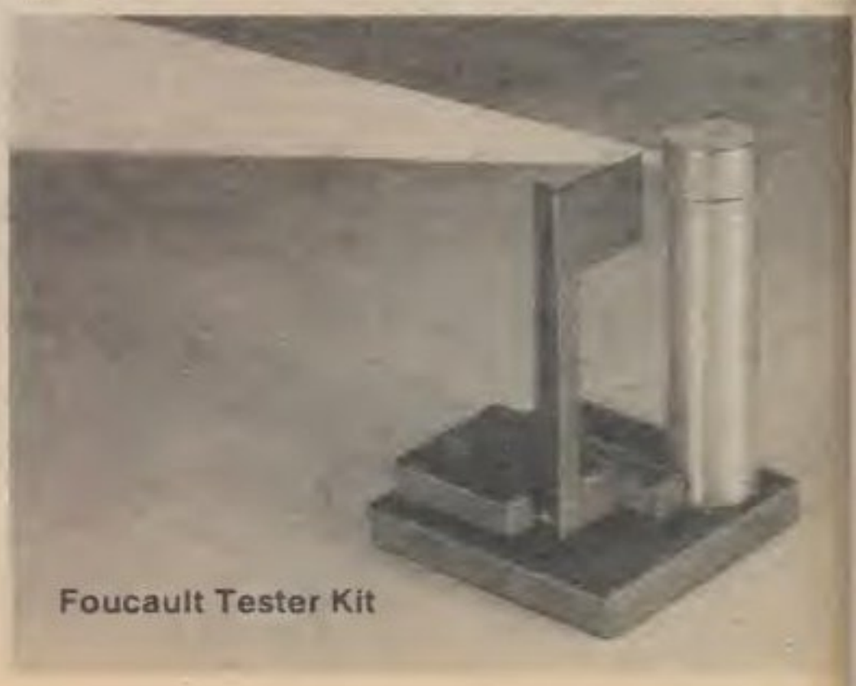
Edmund Scientific Company's
Modern Optical Facilities Are Growing
The new 10,000 sq. ft. Optical Design and Manufacturing Facility serves the manufacture of precision spheric and aspheric reflective optics for industry within ⅛ wave accuracy. It is equipped with high capacity curve generators, grinders and polishers, and a state-of-the-art test tunnel. Current customizing capabilities include, but are not limited to, 2½ to 12¼-inch diameters. Contact our National Sales Department or send your specifications and drawings for a custom quotation.

Abrasives In Convenient Containers
For Mirror Grinding or Industrial Use
Available in grades from coarse to extra fine, these abrasive should be used in the order listed below. Guaranteed fr from contamination. Last two items listed are suggested fo fast polishing. (The weights shown are approximate):

Number	Description	Quantity	Price
40,022	# 80 Aluminum Oxide	16 oz.	$2.95
40,021	#120 Aluminum Oxide	6 oz.	1.95
42,550	#220 Aluminum Oxide	2 oz.	1.50
42,551	#320 Aluminum Oxide	2 oz.	1.50
42,552	#400 Aluminum Oxide	2 oz.	1.65
42,553	#600 Aluminum Oxide	1 oz.	1.50
42,554	#305 Emery	1 oz.	1.40
40,015	Red Jewelers Rouge	8 oz.	3.95
40,152	Cerium Oxide	4 oz.	4.95
40,153	Cerium Oxide	8 oz.	7.95

"Homebuilt Telescopes" . . . A great book on mirror grindi for amateurs. Make a mirror accurate to ⅛ wave. Illustrate 36 pages. **No. 9066 $1.5**

Foucault Tester Kit.
Build your own Foucault tester to test spherical and paraboli mirrors. Kit has 7.5 W bulb & socket, knife-edge, wire, cor plug, slide, 5x5" base, 6" column, cap, hardware and instru tions. **No. 70,977 $14.5**



Foucault Tester Kit

Astronomical Telescope Mirrors.

All Edmund manufactured mirrors 4¼" diameter and larger are made from Pyrex® glass, polished and figured to ⅛ wave accuracy, aluminized and overcoated.

Parabolic						
Number	Dia.	f Ratio	App. f.l.	Thick	Shpg. Wt.	Price
42,451	4¼"	4	17½"	¾"	.9 lb.	$ 46.95
72,472	6"	5	30"	1"	3 lb.	81.95
72,361	6"	6	36"	1"	5.5 lb.	81.95
5,002	6"	8	48"	1"	3 lb.	74.95
85,298	8"	5	40"	1⅜"	5.5 lb.	159.95 T.C.C.
85,069	8"	8	64"	1⅜"	5.5 lb.	138.95 T.C.C.
85,334	10"	6	60"	1¾"	11 lb.	234.00
85,070	10"	8	80"	1¾"	11 lb.	249.00 T.C.C.
85,335	12½"	6	75"	2⅛"	21 lb.	349.50
85,071	12½"	8	100"	2⅛"	21 lb.	369.00 T.C.C.

Spherical				
Number	Dia.	App. f.l.	Thickness	Price
40,913	2½"	25"	⅜"	$ 9.95
50,082	3"	30"	⅜"	13.95
50,051	4¼"	45"	⅝"	29.95
71,026	6"	60"	1"	58.95

Elliptical-Shaped Diagonal Mirrors

Number	Minor Axis	Major Axis	Thickness	Price
30,839*	0.875	1.167	¼"	$18.95
30,260	1.062	1.502	¼"	6.95
30,205	1.250	1.768	⅜"	7.95
30,258	1.500	2.121	⅜"	13.95
30,840*	1.875	2.581	⅜"	24.95
41,131	2.250	3.182	⅜"	39.95
42,583*	2.625	3.712	⅜"	43.95
42,584*	3.000	4.242	⅜"	56.95

*Denotes mirrors made of Pyrex® glass.

Mounted Diagonal Mirrors.

For 3-inch telescopes. Cemented to angle bracket. Mirror face 21x29 mm. **No. 60,087 $6.95**

For 4¼-inch Telescopes.
Cemented to 3¼" vane and holder. Mirror face 25x34 mm. **No. 60,086 $8.95**

Unmounted Diagonal Mirror for 3-inch telescopes. 16x23 mm. **No. 30,875 $2.95**

Mirror Diagonals. Aluminized & overcoated, ideal for use as secondary mirrors.

For 3-inch Telescopes. 21x29 mm. **No. 30,876 $5.00**
For 4¼-inch Telescopes. 25x34 mm. **No. 30,877 5.00**

Diagonal Holders Single-Vane flat-type. For 3-inch and 4¼-inch telescopes. **No. 61,057 $2.95**

Quality Elliptical-Shaped Diagonal Mirrors

***Aluminized and overcoated *Surface flat to ⅛ wave**

The table below gives the recommended diagonal mirror (by stock number) for general purpose Newtonian telescope configurations. First entries refer to diagonals for visual and narrow field, higher magnification work. Second entries (in parentheses) refer to diagonals for wide field, lower magnification and photography.

Primary Mirror Diameter	Focal Ratio f/4	f/5	f/6	f/8
4¼"	30,258 (30,840)	30,205 (30,258)	30,205 (30,258)	30,260 (33,258)
6"	30,840 (41,131)	30,258 (30,840)	30,205 (30,840)	30,205 (30,840)
8"	41,131 (42,583)	30,840 (41,131)	30,258 (41,131)	30,205 (30,840)
10"	41,131 (42,583)	30,840 (41,131)	30,258 (41,131)	30,258 (41,131)
12½"	42,583 (42,584)	41,131 (42,583)	30,840 (41,131)	30,258 (41,131)

Note: for specialized work (e.g., variable star observing & special photographic applications) larger diagonals are required. Refer to texts covering such applications.

Telescope End Rings

Made of rugged aluminum for stable mounting of primary or secondary mirrors (same as used on Edmund 6-inch f/6 & 8-inch f/5 telescopes). Primary Mirror End Ring includes mirror mount, 3 spring-loaded jack screws & 3 locking screws for precise alignment. Counter balance mounting hole provided.

(A) Primary Mirror Rings

For 6-inch Telescopes **No. 72,339 $49.50**
(Use phenolic tube, 6¾" I.D. Accepts 6" dia. mirrors)
For 8-inch Telescopes. **No. 72,340 $59.50**
(Use phenolic Tube, 9¼" I.D. Accepts 8" dia. mirror)
For 4¼-inch Telescopes **No. 72,470 $44.50**
(Use phenolic tube 4⅞" I.D. Accepts 4¼" dia. mirror)

(B) Diagonal Holder End Rings.

Uniquely designed spider-type mount provides pre-tensioned, stable secondary mirror mount with 3 full degrees of freedom; 0.005" thick provides minimum diffraction and light loss.
For 6-inch telescopes **No. 72,341 $49.50**
(Use phenolic tube 6¾" I.D. Accepts No. 30,840 diagonal)
For 8-inch telescopes **No. 72,342 $59.50**
(Use phenolic tube 9¼" I.D. Accepts No. 41,131 diagonal)
For 4¼-inch telescopes **No. 72,471 $44.50**
(Use phenolic tube 4⅞" I.D.)

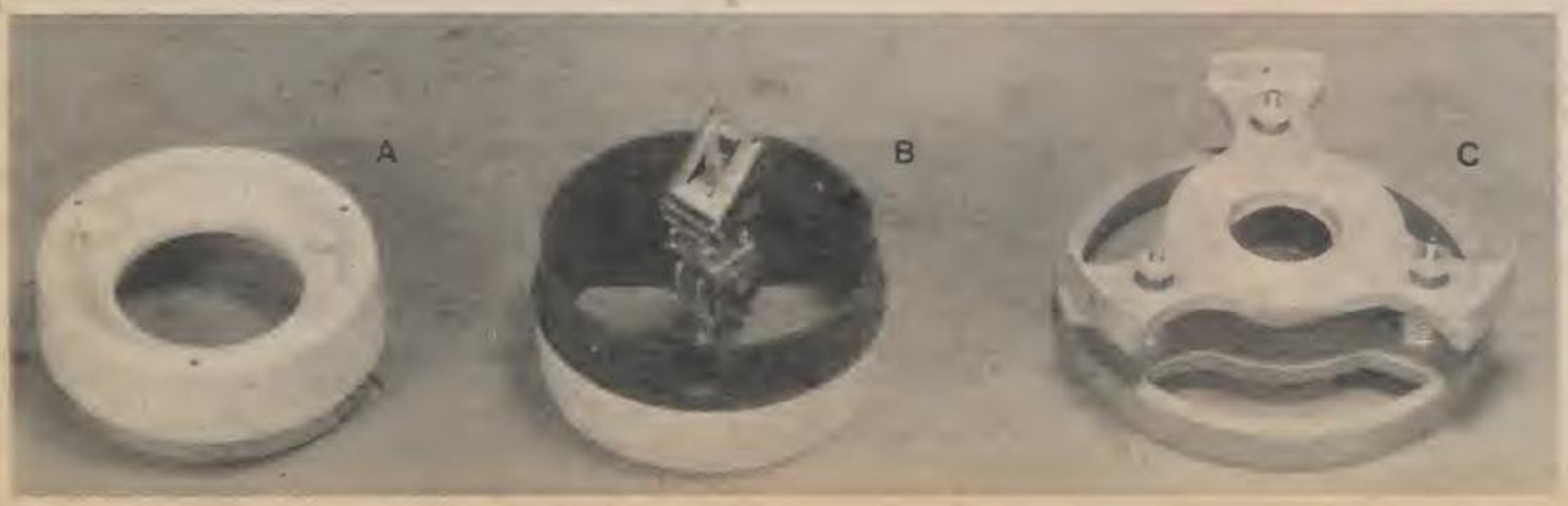
(C) High Quality Mirror Mounts

3-inch. This is an excellent low-cost mirror mount. It comes unassembled with complete directions. Outer diameter is 3½". **Fits our No. 85,012 aluminum tube.** Shims not included. **No. 50,109 $6.95**

4¼-inch. Adjusting clamps act on mount alone. Metal clips hold mirror to mount. 3-point suspension. Mount O.D. 4⅞" **Fits our No. 85,013 aluminum tubing**, can be shimmed for No. 80,038 tube. Unassembled, with directions (not illus.). **No. 50,079 $12.95**

6-inch Cast Aluminum. Completely assembled. Metal clips hold mirror firmly. Outer diameter of mount $6^{13}/_{16}$". **Fits tubing No. 85,293 phenolic or No. 85,008 cardboard.** **No. 50,117 $14.95**

8-inch Cast Aluminum, Assembled. Metal clips to hold mirror. O.D. 9". With shims (not incl.) **will fit our tube No. 85,146.** **No. 70,072 $21.95**



Totally Redesigned Lightweight Equatorial Mounts

• Cast Aluminum Alloy • Quick release knobs for easy adjustment
• Enclosed clock drive gears • Nylon bearings • Easy-to-read setting circles

We've completely redesigned the traditional equatorial mount, developing a lightweight medium duty unit that is easy to use and set up. It has quick release knobs for adjustments to positioning and balancing. Easy-to-read setting circles and sturdy tube straps are included. All these features in a mount that is competitively priced! The Edmund Equatorial Mount reflects intensive research and engineering. Use it once and you'll agree it was time well spent.

Medium Duty Equatorial Mount

Excellent for reflectors up to 6" and for refractors up to 4". Sturdy design eliminates vibration; nylon bearings offer smooth operation. Variable latitude adjustment (0–90°). Setting circles and two straps supplied with all mounts. Pedestals are 23" high, heavy gauge 3" steel tubing. 3-toed base is cast aluminum with a tan finish. Tripods are made from kiln-dried hardwood and include leg braces.

Medium Duty Equatorial Mount

Description	Shpg. Wt.	Number	Price T.C.C.
Medium duty mount with clock drive & pedestal	27 lbs. (12.2 kg.)	85,309	$159.50
Medium duty mount with clock drive	16 lbs. (7.3 kg.)	85,312	119.50
Aluminum pedestal only	16½ lbs. (7.5 kg.)	85,313	52.50
60" wood tripod	9½ lbs. (4.3 kg.)	85,314	69.59
Extra Counterweight	7 lbs. (3.2 kg.)	42,648	9.50

Heavy Duty Equatorial Mount For Large Telescopes

For 6", 8" and 10" reflectors; also handles 5" refractors. Fine latitude adjustment, polar angle adjustment from 0° (Equator) to 76° (Devon Island, Canada). Cast iron for rigidity. **Straps adjust for all telescopes mentioned above.** Shpg. Wt. 100 lbs. (45.4 kg.). Includes clock drive.
No. 85,172 $299.50 T.C.C.

Mount with setting circles only (no clock drive) Shpg. Wt. 95 lbs. (43.1 kg.)
No. 85,134 $219.50 T.C.C.

Pedestal Base for Above Mount. Cast iron post (4" I.D.). Three 2' long feet; 30" high. 83 lbs. (37.6 kg.) **No. 85,145 $99.95 T.C.C.**

Additional Counterweights For 8" Telescope Mounts. Center hole diameter: $1^{17}/_{32}$". 4 lbs. Locking thumb screw. **No. 72,113 $12.95**

Synchronous Electric Clock Drive And Accessories

Clock Drive Motor. Operates on 110 V AC. $^{3}/_{16}$" dia. x 2¼" shaft; rotates 1/15 rpm counterclockwise; torque 30"/oz. 2 mounting holes. 6" leads. Size (excl. shaft) $2^{1}/_{8}$x$1^{5}/_{16}$x$2^{7}/_{16}$". **No. 50,199 $14.50**

Matching Worm Wheel Set. 3" pitch dia., 32 pitch, 96 teeth, $^{7}/_{32}$" face, 0.375" dia. bore. Steel worm with 0.1875" bore. **No. 30,307 $24.95**

Operate Clock Drive Anywhere. Operating from car battery, small inverter supplies 110 V, 60 Hz, 15 W rating. Can also operate low current 110 V AC appliances. 2½x2½x4". 21 lbs. For 12 V battery only. **No. 50,346 $41.95**

"Mounting Your Telescope", by Sam Brown. Illustrated, step-by-step guide on equatorial mounts, clock drives, more. **No. 9082 $1.50**

Forks

	8-inch Telescope Fork	6-inch Telescope Fork
Overall size	15.43 x 22.5 x 4.25"	13 x 20 x 4.25"
Distance between Tines (top)	11.65"	9.50"
Distance between Tines (base)	10.0"	8.25"
Decl. axis to top of base	17.8"	15.2"
Polar axis hole diameter	1.375" w/2.5" dia. machined boss	1.375" w/2.5" dia. machined boss
Decl. axis hole diameter	0.8125" dia. in-line within 0.005" & square to polar axis hole within 5 arc minutes	0.8125" dia. in-line within 0.005" & square to polar axis hole within 5 arc minutes
Weight	13 lbs.	11 lbs.
Number & Price	No. 80,283 $119.50	No. 80,285 $99.50

Cradles

	8-inch Telescope Cradle	6-inch Telescope Cradle
Overall size	12 x 11.38 x 10.63"	10 x 9.18 x 8.12"
Tube Hole I.D.	9.75"	7.25"
Declination Hole diameter	tapped ½; 13 in-line w/in 0.005" w/3" dia. machined bosses	tapped ½; 13 in-line w/in 0.005" w/3" dia. machined bosses
Weight	5.1 lbs.	4.8 lbs.
Number & Price	No. 80,282 $89.50	No. 80,284 $79.50

Telescope Tubing—All Sizes

Number	I.D.	O.D.	Length	Description	Wt. lbs. (kg)	Price
80,038	4⅞"	5¼"	46"	Spiral paper	6 (2.7)	$ 9.00
85,008	6⅞"	7⅜"	60"	Spiral paper	10 (4.5)	12.50*
85,011	2⅞"	3"	48"	Aluminum	5 (2.3)	17.95*
85,012	3⅞"	4"	60"	Aluminum	6 (2.7)	29.95*
85,013	4⅞"	5"	46"	Aluminum	6 (2.7)	34.95*
85,293	6¾"	7"	60"	Phenolic	8 (3.6)	49.95*
85,146	9¼"	9½"	63"	Phenolic	10 (4.5)	79.95*
85,282	6¾"	7"	33½"	Phenolic	6 (2.7)	31.95*
85,283	9¼"	9½"	34½"	Phenolic	8 (3.6)	49.95*

*T.C.C.: dimensions may lead to premium shipping rates. Check with your local motor freight office.

Spider Mount For Diagonals
Brass, 4 legs, adaptable to tubes 5 to 9" I.D. For mirror or prism. 1" square plate mounted on 45° angle. Adjusts with set screw. Instructions. **No. 50,025 $9.95**

Helical Gear Shaft and Knobs
Far superior to straight rack & pinion—smooth operation. One piece steel shaft and helical gear. Brass bushings. 14 teeth per inch, face 0.236", pressure angle 14½°, pitch 14, shaft 0.177" diameter, 2⅜" length. Gear O.D. 0.275". **No. 40,197 $7.95**

Brass Helical Rack. Meshes with gear above.
Length 4" **No. 40,196 $3.95**
Length 11¾" **No. 40,195 9.95**

Brass Gear Shaft With Knobs
¼" dia., 10 teeth/inch, 48 pitch, 2" long. Meshes with brass racks below. ⅞" dia. Knobs fit ends, set screw locked. **No. 40,164 $1.95**

Brass Racks. Mesh with gear above. ⅛" face, pressure angle 14½°, pitch 48.
Length 4" **No. 40,060 $1.95**
Length 6" **No. 40,054 2.95**
Length 12" **No. 40,053 5.95**

Zoom Spotting Telescopes

The Telemaster Senior

• One Of The World's Finest 15 to 60X Zoom Telescopes

Simply aim, focus, zoom—your favorite activities spring to life in vivid close-ups! The 60 mm objective and 14 fully-coated elements ensure crisp, bright images.

Specifications: f/16 to f/64
1,000 to 4,000 mm focal length
3°–45' angle of view
160 to 40' field of view @ 1,000 yds.
15 mm eye relief

Includes slide-out sunshade, screw-on dust cap & 13" high adjustable table-top tripod for vibration-free viewing. See page 27 for camera adapters. **No. 72,363 $399.95**

(B) The Telemaster Junior

• 25 to 50X Zoom Spotting Telescope

A compact, lightweight version of the Telemaster Senior, this multi-purpose 50 mm telescope resolves images to brilliant clarity. Use one of the camera adapters on page 27 to make a great 1700 to 3400 mm telephoto lens. Focuses 16' to infinity & includes internal focusing, dust cap & tripod. Camera not included.
No. 72,276 $299.95

Telescope Case **No. 72,278 28.50**

(C) Reasonably Priced
13 to 40X Zoom Telescope

This large, coated 40 mm achromatic objective has excellent light-gathering & resolution characteristics. Sturdy 16" metal body has both focusing barrel & zoom adjustment. 9" folding table-top tripod has ball-swivel mount with lock. Protective lens cap included. Camera not included. **No.71,054 $79.95**

Telephoto Adapter for Jr. & Sr. Telescopes

This element screws onto the Telemasters' eyepieces; the other end connects to the appropriate "T" mount compatible camera adapter ring. Series V filter adapter is built-in. **No.40,955 $19.50**

Camera Adapters. "T" compatible. Connect SLR cameras to telephoto adapter above. See page 27 for the adapter to fit your camera.

Don't miss our newest multi-purpose Terrestrial Spotting Scope, Voyager 6001, on page 5.

Passport To The Stars

Astronomy Has Never Been So Easy—Or So Much Fun!

Come explore the heavens with **Passport To The Stars,** Edmund Scientific's brand new, step-by-step program in astronomy. It's fun, it's easy, it's fascinating . . . eight simply, yet carefully structured Phases that can open up a whole new universe for you!

You'll find out how to identify stars, planets and galaxies. Locate major sky markers & constellations. Choose the telescope and accessories that are right for you. Observe the craters of the moon & eclipses . . . you'll even acquire the basic techniques of astrophotography! Your comprehensive 8-Phase itinerary has been prepared in clear, easy-to-follow style by a team of astronomers under the direction of Terry Dickinson, one of North America's leading writers on astronomy.

Each fascinating Phase is broken down into modules which build into a comprehensive guide to amateur astronomy and its instrumentation. You also receive a special, long-lasting, **Passport To The Stars** 3-ring, vinyl-covered binder.

Upon completion of Phase VIII, you'll be fully acquainted with all major aspects of astronomy—able to locate, track & identify all of the important stars, planets & galaxies and then record your sightings in your unique **Passport To The Stars** Log!

As a FREE Bonus, you'll receive a full year's subscription to Astronomy News, packed with up-to-the-minute information on Astronomy and the seasonal skies. And, to speed you on your adventure into the cosmos, throughout the course, you will receive valuable discount coupons on selected Edmund Scientific products. In addition you will receive a handsome certificate, suitable for framing, signifying your participation in and completion of this fascinating voyage!

You won't find this extraordinary program anywhere else—never has so much effort been devoted to anticipating & answering the questions of beginning star gazers. Only the experience & resources of Edmund Scientific make it possible for you to take part in this program for the low, all-inclusive figure of $49.95.

Passport To The Stars offers the perfect opportunity for the amateur astronomer to master the basics of this unique, absorbing science—a skill which will last you a lifetime! Don't delay—begin your voyage by filling in **No. 9600** on the order form in this catalog. Do it now!

Every 4 weeks you receive a new, information-packed installment of your journey, including star charts—both seasonal and regional—to plot your course. You can also look forward to valuable, FREE surprises!

*Join **Passport To The Stars** today!* **No. 9600 $49.95**

Your 8 Phase guide to the basics of astronomy will cover the following topics:

PHASE I: ASTRONOMY FROM YOUR BACKYARD. Identify major elements of the night sky with the unaided eye.

PHASE II: STARS AND CONSTELLATIONS. The summer sky for binocular users or the unaided eye.

PHASE III: TELESCOPES FOR AMATEUR ASTRONOMY. How to select the right instrument—comparative costs, features, advantages and limitations.

PHASE IV: SUN, MOON AND ECLIPSES. How to safely observe the solar surface. Lunar topography.

PHASE V: PLANETS, COMETS AND METEORS. How, where and when to find these moving bodies.

PHASE VI: PROBING BEYOND THE SOLAR SYSTEM (PART I) Double stars, variable stars, etc.

PHASE VII: PROBING (PART II). Globular clusters, nebulas and galaxies. Where and what to look for.

PHASE VIII: PHOTOGRAPHING THE SKY SHOW . . . with or without a telescope.

Your Unlimited Money-Back Guarantee

*If, at any time after Phase III, you are dissatisfied, for any reason, with **Passport To The Stars**, simply return all the materials you have received and we will be happy to refund every penny of your purchase price.*

Buyers Guide
TO BINOCULARS

Be discriminating in your choice of a binocular. When you choose from the Edmund line, you are receiving a "quality" instrument. Be assured that we have checked the optics for collimation & defects, eyepiece focusing, hinges, appearance & accessories.

Good quality means that your binoculars have achromatically corrected oculars & objectives and that all optical elements are coated. Each binocular we carry comes complete with carrying case, treated lens wiping cloth, dust caps & carrying straps.

Binoculars are classified by a standard numbering system, for example, 7x35. The first number indicates magnification (7 power makes an object 700' away appear to be only 100' away). The second number represents the diameter in millimeters of the objective lens which determines the amount of light gathered & transmitted to the eye.

How much magnification do you need? As magnification increases above 9, hand vibrations become apparent. At higher powers, most people require a mount. High power decreases the field of view so you may need more light to see objects clearly. High power is best suited when viewing relatively stationary objects for which the small field of view & image vibration can be managed.

How much light do you need? Objective lens diameter determines how much light is transmitted to the eye. As the diameter increases, the amount of light increases and the image becomes brighter. However, with increase in diameter, binoculars become more cumbersome. We recommend an average of 20 mm for day-time viewing, 40 mm for day & evening, and 50 mm or more for evening & nighttime use.

Field of view is often expressed as the maximum width of visible field (in feet) at a distance of 1,000 yards. Edmund's line offers three types of binoculars:

Standard binoculars offer a balance of light-gathering power, field of view and magnification that make them ideal for general applications such as boating.

Wide Field binoculars offer a greater visibility range, making them excellent for viewing outdoor sports in which action moves quickly.

Extra Wide Field binoculars offer views of wide expanses, as much as 1½ times that of a similar standard binocular.

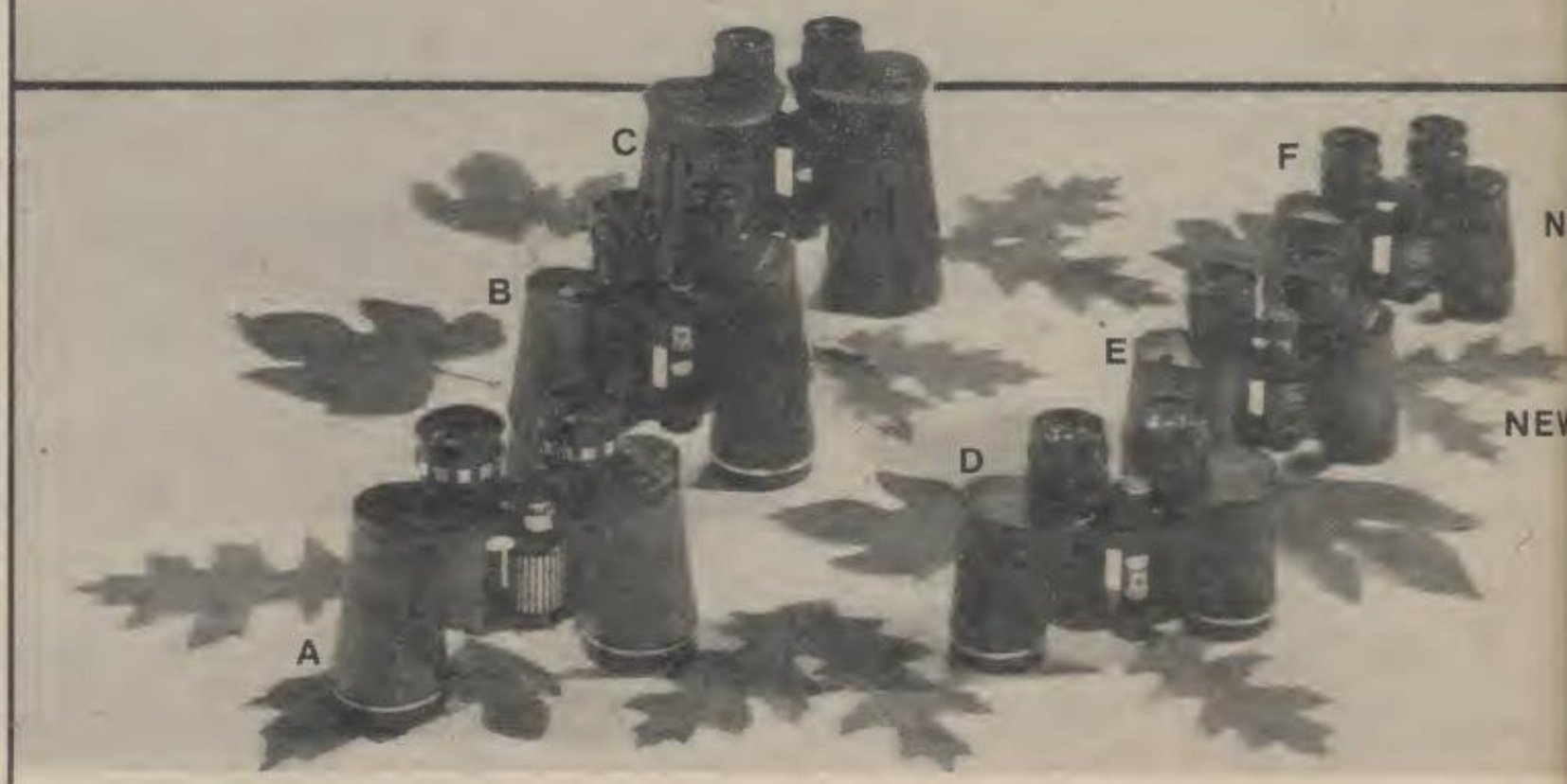
True binoculars are not field glasses. All Edmund binoculars are true prism types—either Roof Prism or Porro Right Angle. The roof prism type is recognizable by the coincidence of optical axes of the objective and ocular. This means more compactness and lighter weight than porro prism types.

The Exit Pupil determines the relative brightness of a binocular. If a viewer's eye pupil contracts to less than the exit pupil diameter, the effective brightness is limited by the eye rather than by the exit pupil.

Relative Brightness is defined as the square of the exit pupil. When the eye can assimilate all light reaching it, the RB figure can be used as a valid comparison of the image brightness obtained.

Coating Optics increases light transmission by as much as 50% since it reduces the amount of light reflected at the surfaces of each element. The result is a brighter, sharper image than uncoated optics can produce under similar conditions.

Application	Recommended Binoculars
Watching sports events	7 x 35, 8 x 30
Outdoor activities	8 x 20, 8 x 30, 7 x 35
Bird watching	7 x 35, 8 x 40, 7 x 50, 10 x 50
Touring, general purpose	7 x 35, 8 x 40, 7 x 50
Star gazing, twilight use, yachting	7 x 50, 10 x 50
Long distance land observations	20 x 50, 20 x 60 (use with tripod)



7 X 50 All Purpose Binoculars
The Most Popular Combination of Power & Size

Quality binoculars with fully coated optics bring you all the action with bright, clear images whether conditions are sunny or cloudy. Ideal for night use too! Each includes a protective carrying case.

(A) Wide-Field Binocular. For fast sports like soccer & racing where the action changes quickly. See it when it happens! **No. 1558 $119.95**

Wide-Field (not shown) **No. 1554 89.95**

(B) Pentax Standard Field.* Our choice for value & quality! Multi-layered interference optics screen out ultraviolet & infrared rays. **No. 1593 $155.00**

(C) Waterproof Binoculars.* The tough armored rubber covering that absorbs shock & the waterproof feature make this ideal for boating & hunting. Individual focus. **No. 1586 $325.00**

Wt. Oz.	Relative Brightness	Field of View @ 1,000 Yards	Number	Price
55.0	50.0	385'	1586	$325.00
35.2	50.0	372'	1593	155.00
28.0	50.0	525' Extra Wide	1558	119.95
28.0	50.0	420' Wide-Field	1554	89.95

7 X 35 Wide Field Binoculars
Lightweight—Makes Carrying a Cinch!

If you're a bird watcher or fast action sports fan, these binoculars are for you. Fully coated optics provide crisp, brilliant images in daytime illuminations. Protective carrying case included.

(D) Pentax Wide-Field.* Multi-coated for full eye protection against infrared & ultraviolet rays. Offers excellent resolution. Our highest quality wide-field binocular! **No. 1592 $190.00**

(E) Bushnell Extra Wide Angle. Lightweight with oversize porro prisms so you don't miss the action. Features "Insta-Focus" to speed & simplify focus changes. **No. 1532 $79.95**

(F) Bushnell All Purpose Wide Angle. A general purpose favorite for sports, travel & all outdoor viewing. "Insta-Focus" lever action works 3X faster than most systems. **No. 1569 $49.95**

Wt. Oz.	Relative Brightness	Field of View @ 1,000 Yards	Number	Price
31.7	25.0	578' Extra Wide	1592	$190.00
19.0	25.0	578' Extra Wide	1532	79.95
17.0	25.0	500'	1569	49.95

7 x 50 Standard Binocular
- **Excellent Versatility For General Use**
- **Our Choice For Spectator Sports**

Wt. Oz.	Relative Brightness	Field of View @ 1,000 Yards	Number	Price
27.0	50.0	372' Standard	1557	$69.95

You'll get bright, clear images from this excellent multi-purpose binocular. It's exceptionally good for bird-watching, boating, hunting, sports & star-gazing. The fully coated optics increase light transmission up to 50%. Fold-down eyecups offer comfort for eyeglass wearers. Comes complete with handsome carrying case and straps. This binocular earns its keep by paying off in solid enjoyment wherever you take it. No wonder it's Edmund's best-selling all-around binocular!

No. 1557 $69.95

Buy With Confidence!
Satisfaction Guaranteed
Or Your Money Back.

*Denotes Our Best Quality

Binoculars

Higher Power Binoculars That Bring The Action Even Closer

These higher power binoculars are excellent for long range viewing. All have fully coated optics, roll-down rubber eyecups for eyeglass wearers, and a protective carrying case.

(G) 8 X 30 Bushnell Sportview. A vacation compact for short & long distance viewing. Features "Insta-Focus" & Kwik-Draw case. **No. 1559 $49.95**

(H) 8 X 40 Pentax Wide Field. * This sleek-styled, center focus binocular is highly recommended for the more discriminating buyer. Multi-coated for eye protection against infrared & ultraviolet rays. Its rugged construction will last your lifetime! Our choice for quality. **No. 1591 $195.00**

(I) 8 X 40 Bushnell Wide Angle. A powerful compact for extra detail in viewing & good brightness in poor light. "Insta-Focus" speeds & simplifies focus changes. **No. 1582 $99.95**

Wt. Oz.	Relative Brightness	Field of View @ 1,000 Yards	Number	Price
34.5	25.0	499' Extra Wide	1591	$195.00
22.5	25.0	473' Wide	1582	99.95
19.0	14.0	394'	1559	49.95

Zero In With Zoom Binoculars Fingertip Control Changes Magnification

See all the action as it happens by "zooming" in on a particular object. Fully coated optics, roll-down eyecups & protective carrying cases with each. For those who prefer the zoom feature.

(J) 7–15 X 35 Zoom. This lightweight, compact model offers good power and quick close-ups. Great for horse races and stadium viewing. **No. 1583 $119.95**

(K) 7–21 X 40 Bushnell Wide Angle Triple Zoom. This quality mid-range zoom features ultraviolet filters and matched optics for comfortable viewing of bright, clear images. **No. 1598 $186.00**

(L) 8–24 X 50 Bushnell Triple Zoom. Our choice for extra power & extra brightness. Ultraviolet filters block reflected glare. The most powerful zoom binocular we carry! **No. 1597 $199.00**

Wt. Oz.	Relative Brightness	Field of View @ 1,000 Yards	Number	Price
30.0	39.7 @ 8X	247' @ 8X	1597	$199.00
25.0	32.5 @ 7X	281' @ 8X	1598	186.00
23.5	25.0 @ 7X	325' @ 7X	1583	119.95

Long Range Binoculars For Scanning Distant Vistas To Target Spotting

This is the preferred binocular when your need for extra power exceeds considerations of size of field of view. Coated optics & carrying case included with each. Standard camera tripod (not included) is recommended for all models listed below.

(M) 20 X 50 Extra Magnification. Recommended for use when extra power is needed and lighting conditions are good. Fold-down eyecups offer comfortable viewing for eyeglass wearers. **No. 1538 $79.95**

(N) 10 X 50 Bushnell Extra Power. An excellent choice for viewing greater detail, even under adverse lighting conditions. "Insta-Focus" for quick and simple focus changes. **No. 1588 $119.95**

(O) 20 X 60—Our Most Powerful Distance Binocular Features the optical design used on the Apollo/Soyuz space flight. Fold-down eyecups & shock-resistant objective rims are included. **No. 1556 $179.95**

Wt. Oz.	Relative Brightness	Field of View @ 1,000 Yards	Number	Price
47.5	9.0	173'	1556	$179.95
26.0	25.0	367'	1588	119.95
27.0	6.3	157'	1538	79.95

(P) 8 x 30 Roof Prism Monocular. This 8 x 30 instrument will provide hours of outstanding viewing for everyone from hikers to coin collectors. Compact & lightweight, it serves as a telescope or as a magnifying lens. Precise eyepiece focusing & multi-coated lenses eliminate eye fatigue and give bright, clear images every time. Use as a standard 8X monocular or add the close-up lens & transparent lens stand for use as a 30X microscope. **No. 15,101 $139.95**

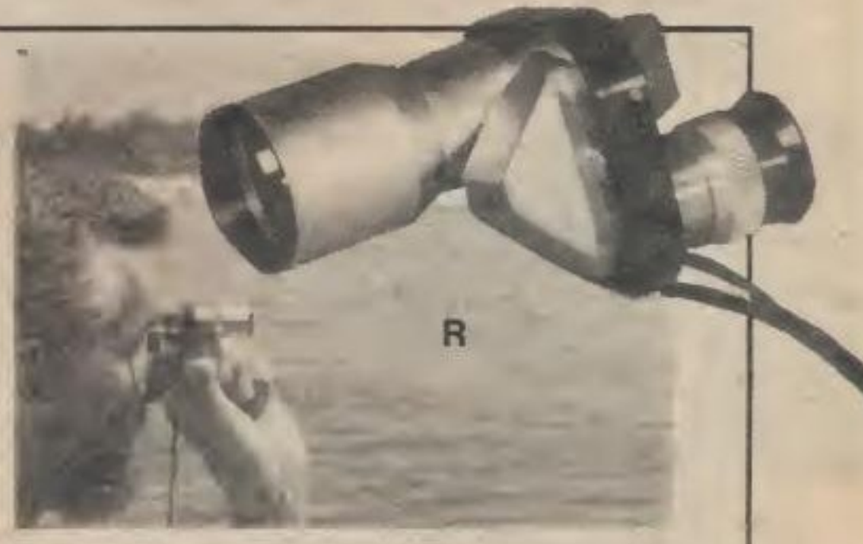
(Q) Compact, Fully Coated 10X Spotting Scope. Small but powerful, it's perfect for hunting, sailing & sporting events. 30 mm objective lens gives over twice the light-gathering power of a 20 mm lens. 183 ft. field of view at 1,000 yds, ¼"–20 tripod adapter mount. A mere 10" long, it only weighs 11 oz. This compact unit is a must for sport & nature buffs! **No. 72,218 $34.95**

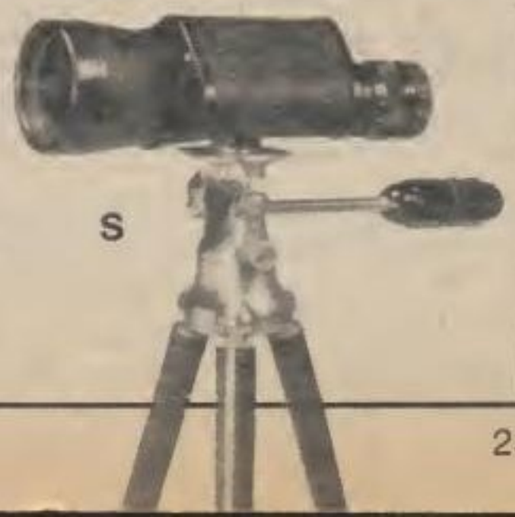
(R) 8X and 10X 20 mm Monocular Scopes. Perfect for nature study & racing fans! Compact 3¼x2x1½", 2 oz. Fully coated optics w/fingertip focusing. Each comes with neck strap and handy leatherette case.

Mag. Power	Lens Dia.	Field of View @ 1000 yards	Number	Price
8X	20mm	305 ft.	1568	$29.95
10X	20mm	263 ft.	70,126	34.95

(S) Fully Coated Quality Monocular. 7 x 50 with tripod socket. Fits any photo tripod. Offers 375 ft. field of view at 1,000 yards. R.L.E.—75. 7 mm exit pupil. Wt. 16 oz. **No. 70,639 $56.95**

Write to our Marketing Division for your FREE copy of our new, fully illustrated **"Buyers/Owners Guide To Binoculars" (No. 9950).**





Binoculars

A

B

NEW!
C

D

E

(A) Introducing The Bino/Cam
It Can Change The Way You See The World!
Until now, you didn't have a choice. You could either look through binoculars or use a camera. With the Bino/Cam, you can do both. A brilliantly engineered, 7x20, wide angle binocular with a full 508' field of view is combined with a 110 telephoto camera. Enjoy all the sights up close. With a click the world stands still on film. Bino/Cam's features include a 3-objective, coupled focusing design—adjusts binocular & camera simultaneously for parallax-free shots. **No. 15,100 $249.95**

Type of Film	110 Cartridge
Camera Lens	112 mm F.L., f/5.6
Camera Diaphragm	Click-Stop Aperture f/5.6, 11, 16, 22, 32
Camera Shutter	Metal Focal Plane Speed: 1/125 second
Binoculars	7 Power x 20mm Wide Angle
Finder (Eyepiece)	Aerial Image Finder
Focusing (Camera/Binocular)	30 ft. to infinity
Visibility Adjustment	–4 to +2 diopter
Overall Dimensions	5" long x 4" wide x 2½" high
Weight	19.5 oz.

Accessories
Bino/Cam Case. Hard-sided, felt-lined padded case neck & shoulder strap, dust covers & hood for camera lens. **No. 42,632 $19.95**
Accessory Kit. Includes fully adjustable mini-tripod, neutral density, skylight & medium yellow 35 mm lens filters, rubber eyecups. **No. 42,639 $69.95**
For Manufacturer's Warranty Information, see page 50D.

Mini-Size Lightweight Binoculars
For Birdwatching, Boating, Backpacking & Theater
Convenient, compact units designed with many of the features and quality of full size binoculars. All have fully coated optics & carrying case.
(B) 8 x 30 Pentax Midi. The larger objective offers increased brightness in a compact size. Has coated roof prism optics. **No. 1590 $299.00**

(C) 8 x 20 Bushnell Prismatic. A natural pocketsiz companion for sports fans & travelers. Good quality at reasonable price. **No. 1587 $139.9**
(D) 8 x 20 Zeiss Mini. Offering less magnification tha the 10x25 below, this compact features the highes quality optics & superior craftmanship for which Zeiss known. It folds to the size of a cigarette pack.
No. 1577 $299.9
(E) 10 x 25 Zeiss Mini. An outstanding high magnifica tion compact with the perfect performance of a stan dard size. When you own a Zeiss, you know that yo have top of the line quality throughout. Their innovativ design & use of the finest materials have kept them a the forefront of technology. This mini-binocular, with it foldable body, will serve you well for a lifetime.
No. 1596 $339.9

Wt. Oz.	Relative Brightness	Field of View @ 1,000 Yards	Number	Price
6.7	6.3	285' (Extra Mag.)	1596	$339.95
4.5	6.3	360'	1577	299.95
16.9	13.7	367'	1590	299.00
14.0	6.2	341'	1587	139.95

F

G

NEW!
H

(F) Pocket Rangefinders
Used in boating as well as in telephone, utility & power industries, surveying & home repair. Models available for either horizontal or vertical viewing. Operates on triangulation principle—adjust calibrated dial until white image is superimposed on gold. Then read distance to object on dial. For distances from 8 to 100', accurate to 2%. Carrying case, neck cord, instructions. 8¼" long; 12 oz.
Prism (Vertical) Model **No. 50,138 $99.95**
Direct (Horizontal) Model (not shown).
No. 50,137 79.95

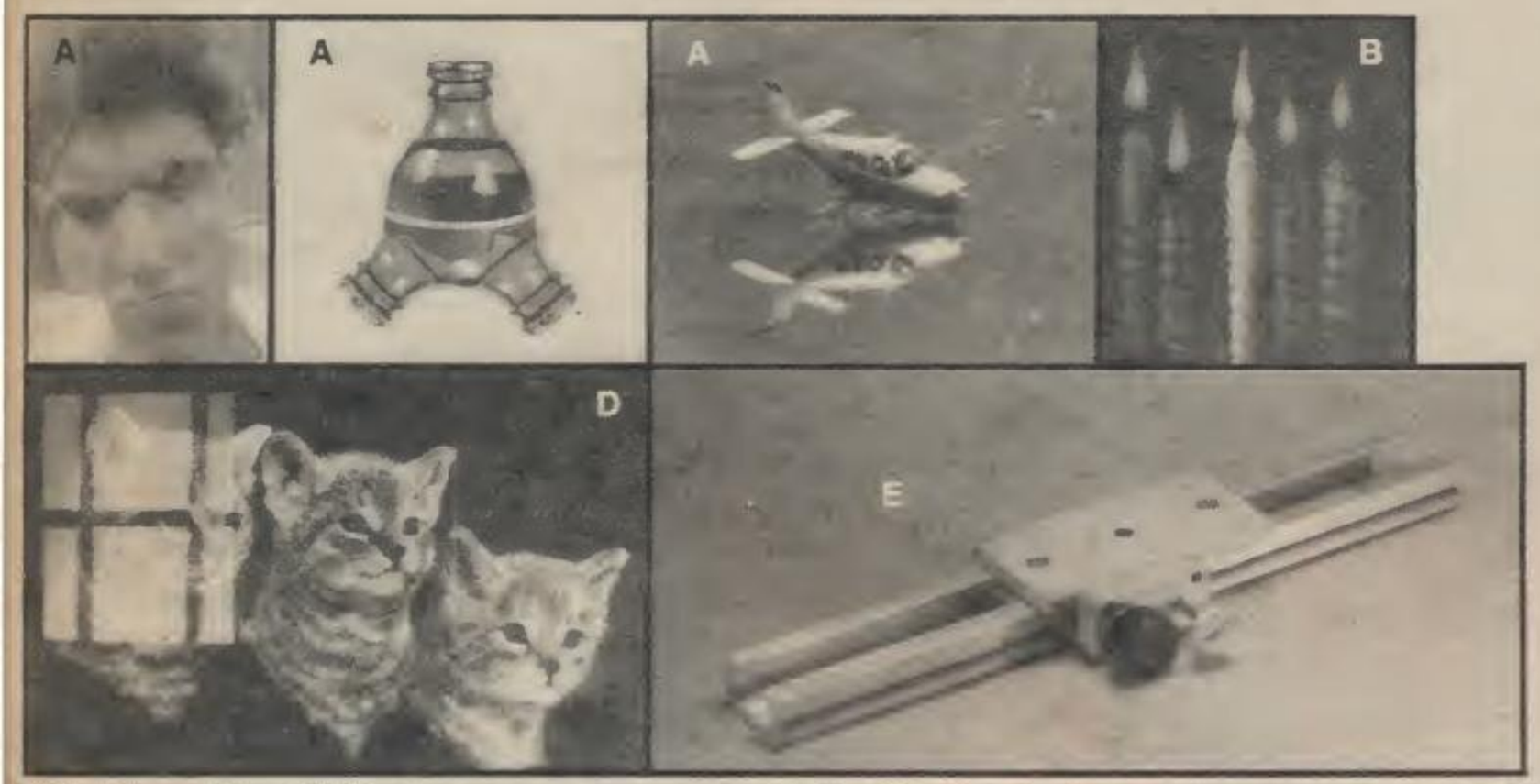
(G) Waterproof Rangefinder
This accurate, compact unit has a single scale which is pre-computed for direct readings up to 2 miles. Has a 6x18 detachable monocular, a 210' field of view @ 500 yds. (50 yd. min. distance usage), less than 1% error @ 100 yds. Includes instructions & carrying case with "in use" holster. 1½"x11"; 22 oz. Ideal for navigation in sight of shore line! **No. 72,327 $89.95**

(H) Measure Distance Quickly & Precisely
The new Ranging 610—Rangematic® takes the guesswork out of measuring. Just frame, focus & read the scale to measure how far, how high, how wide. At last an optical tapemeasure to cover all mid-range measuring projects requiring yardage from 16 to 200 yds. @ 96.7 to 99% accuracy. 8"x4"; 16 oz. Comes complete with padded, vinyl carrying case. This one's a natural for bowhunters! **No. 42,744 $59.95**

Ranging 600 Ft. Optical Tape Measure (not shown). Size up the situation quickly from 50 to 600 ft. The rugged shock-absorbing components offer 96.7% accuracy ±20' at 600'. 8⅛"x4"; 15 oz. Includes handy carrying case. **No. 61,140 $75.95**

Surplus! Limited Supply
Elbow Telescope. 3X U.S. military sighting scope with big 13° field of view, large exit pupil & good eye relief. Makes a nice finder scope. Brass case. Used, but in good optical condition. Wt. 2 lbs., 5 oz.
No. 72,294 $29.95
Mini-Viewer & Case. Yields 5° field of view at 10'. Has mounting shoe, parallax correction knob & leather case. Great for sighting devices or dummy cameras. 1¼" x 1⅞" x 1⅛". **No. 42,532 $2.25**

Photography



(A) Edmund Special Effects And Creative Photography Kit

·Make far-out photo effects & psychedelic slides. A pliable plastic lens can turn Einstein into Frankenstein. Create a two-headed person through the use of mirrors. Patterned glass helps to produce impressionistic photo art. You can turn your photographic work into something for Coney Island or the Louvre. This kit includes three 5"x7" pieces of patterned glass, two front surface kaleidoscope mirrors, a 5"x7" front surface mirror, a 5"x7" piece of clear plastic, a +3 diopter close-up lens (Series VI), a linear diffraction grating, four 2" square metal pattern slides & instructions. All you need is a camera and a creative mind! **No. 71,229 $24.95**

More Special Effects With Multi-E-Mask System *NEW!*

This instant interchangeable mask system lets you vignette your subject in circles & ovals. It also creates a "misty" or cameo in a variety of colors. Included are 16 masks of different shapes & colors, a rotating mask holder & a screw-in adapter ring to fit all standard SLR cameras. **No. 42,740 $39.95**

Create Dramatic Backgrounds With Beam Splitters

The same **Oscar winning technique used in "2001—A Space Odyssey".** Using a 5"x7" neutral beam splitter, you can superimpose one image on an unrelated background. By combining a beam splitter of ⅛" thick non-absorbing float glass (30% reflective, 70% transmission) with a front projection system, you can place photo subjects into any setting you desire. Successfully used by TV stations, this technique is great for movie cameras and 35 mm SLR's. Kit includes beam splitter & detailed instruction booklet. Just add your own projector and reflective screening. **No. 61,097 $9.95**

(B) Jupiterscope™ Light Analyzer

Create colorful images with this product of holographic technology. The soft plastic adheres to camera lens, then peels off. It will not damage coating. Over 150,000 tiny prism shapes bend & twist light. Includes pocket case & book on light & colors. Pkg. of 4.
No. 30,788 $12.95

(C) Easy-To-Cut Transparent Color Filters

These cellulose acetate filters are heat-resistant and 0.005 to 0.01" thick. The colors are vibrant, and fine for use with spot lights or for striking photographic effects.

Book of 44 filters,	8"x10"	**No. 70,638**	**$39.95**
each a different	5"x8"	**No. 60,403**	**21.95**
color	1"x4"	**No. 40,675**	**2.50**
Book of 6 filters (red, green, blue, cyan, magenta, yellow)	8"x10"	**No. 60,373**	**$9.50**
	2"x2"	**No. 40,676**	**1.25**

Booklet of Spectral Absorption Curves for all of the above filters. **No. 9081 $.95**

20"x24" Color Filter Sheets **$5.95 each**

Number	Color		Number	Color	
82,010	Gold Amber	(815)	82,043	Yellow Green	(878)
82,009	Light Amber	(813)	82,004	Med. Lemon	(806)
82,039	Dk. Urban Blue	(866)	82,023	Med. Magenta	(837)
82,031	Daylight Blue	(851)	82,012	Orange	(818)
82,034	Dk. Med. Blue	(857)	82,017	Flesh Pink	(826)
82,038	Lt. Med. Blue	(863)	82,029	Med. Purple	(846)
82,000	Frost	(801)	82,014	Light Red	(821)
82,040	Light Green	(871)	82,015	Medium Red	(823)
82,041	Medium Green	(874)			

The Edmund ColorBurst® Filter

Adds Brilliant Color Highlights to Your Pictures Featured by Norm Rothschild in "Popular Photography", this diffraction material creates rainbow color effects. Simply cut & mount in a filter holder (not incl.) and attach to your lens. 13,000 line per inch diffraction pattern allows you to produce color "bursts" from any point light source. The filter is colorless, so no exposure compensation is required and there will be no color distortion in your photos. By rotating the Colorburst®, you can position the filter to achieve different patterns around the light source. 4½"x4½" of material lets you make 3 filters. **No. 61,063 $5.95**

Multi-image Colorburst® Filter. Comprised of a series of smaller, repeated diffraction patterns.
No. 61,092 $5.95

Small Filament, High Intensity Lamps. Use for projectors, enlargers and viewers.

150 W FCS (24 V)	**No. 41,374**	**$8.95**
500 W DAK (110 V)	**No. 41,154**	**7.95**

Infrared Filter For Photo Light Sources. This glass filter with coating on 1 surface permits only long wave length infrared light to pass. In total darkness, the amount of visible light passing through the filter is indiscernible at 20 ft. Gov't. surplus. 5⅜" dia. x ⅛" thick.
No. 60,033 $4.95

Lens Aperture	Shutter Speed	Subject Distance
f/8	1/25	10 feet
f/5.6	1/50	10 feet
f/4.5	1/50	15 feet
f/3.5	1/100	15 feet
f/3.5	1/50	20 feet
f/2.8	1/100	20 feet
f/2.8	1/50	25 feet

Bargain Infrared Filter. 4"x4¼"x8" plastic filter. Pkg. of 2. **No. 42,299 $2.00**

(D) Denglas . . . Superior Non-Glare Glass

There's simply no comparison! Denglas is invisible compared to regular glass which reflects over 8% of the light, or compared to conventional, dull, etched non-glare glass. Denglas reduces glare so effectively because it's coated on both sides with a durable multi-layer coating. Not only does it enhance the brightness of your picture, it retards fading of pictures and has an indefinite life! Nothing can equal Denglas for multiple matting, framing oils & artwork of a subtle nature. Now being used by the National Gallery of Art. Denglas also has its industrial uses in telescopes & meter faces.

Picture Frame Glass (Rectangular) 0.093" thick

4"x5"	Pkg. of 10	**No. P-42,729**	**$17.95**
5"x7"	Pkg. of 8	**No. P-42,730**	**17.95**
8"x10"	Pkg. of 4	**No. P-72,452**	**18.95**
14"x18"	Pkg. of 4	**No. P-72,497**	**57.95**
16"x20"	Pkg. of 4	**No. P-72,498**	**69.95**

Meter Face Glass (Round) 0.093" thick

2½" diameter	Pkg. of 10	**No. P-42,731**	**$12.95**
3" diameter	Pkg. of 10	**No. P-42,732**	**14.95**
4¼" diameter	Pkg. of 10	**No. P-42,733**	**19.95**

(E) Rack and Pinion Slide for Precise Linear Positioning.

Ideal for photographers, lab technicians & hobbyists. 2"x4" sliding platform holds any equipment requiring fine linear movement. Thumbscrew locks platform in position while knobs control its motion. Non-corrosive aluminum tracks (sold below) have full length rack.

	No. 40,891	**$29.95**
12" Track	**No. 60,572**	**19.95**
24" Track	**No. 60,573**	**29.95**

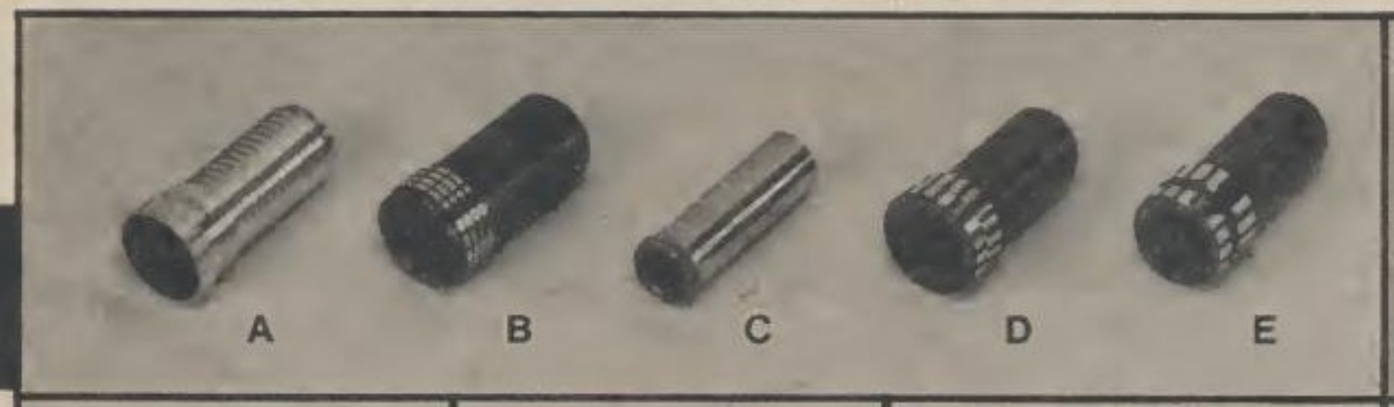
Deluxe Rack & Pinion Unit With Coarse/Fine Adjustment. Rigid steel & aluminum construction. Features coarse (5/8") & fine (1/16") advance per revolution. 9" linear travel on 12"x3"x2" track. 2¼"x3" platform with ¼-20 tapped hole. Locking screw. **No. 71,958 $99.95**

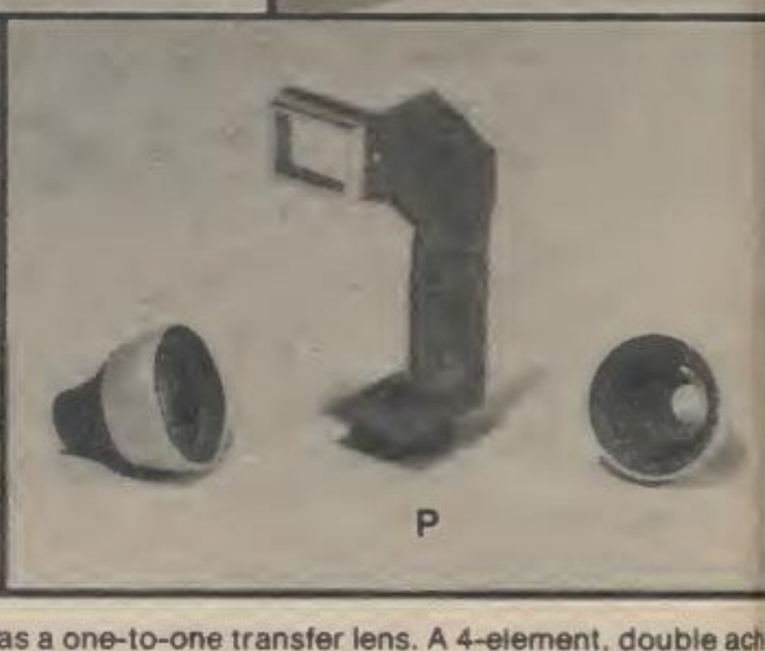
Digital Countdown Stopwatch. Battery-operated unit for darkrooms & timing exposures. Counts up to 9:59 or down to zero from pre-set time. Bright red display & alarm. For details, see page 64.

(F) Ring Light For Shadow-Free Flash.

For close-up photos from 2" to 2'. Attaches to front of lens. Uses battery-fired flashcubes & Burgess Y10 or Everready battery (not incl.). Includes cord & test lamp. Fits 48 mm and 52 to 54 mm lenses only.
No. 42,633 $23.95

Photography





Surplus Lens Bargains!

8 mm Movie Projection Lenses

(A) Wide Angle 19 mm f.l. f/1.6. 33⅓% wider screen image than standard ¾" f.l. 4-element coated system in ⅞" O.D. alum. barrel w/spiral focusing threads. Approx. 2 11/16" long. Fits many 8 mm projectors.

No. 40,727 $4.95

(B) Super 8 mm Zoom. A bargain! We found a limited quantity of Super 8 mm Zoom movie projection lenses. f/1.5 with 20-32 mm f.l. Barrel dia. 1", overall length approx. 1¼".

No. 42,128 $3.25

(C) Low Cost 25.4 mm f/2.5. Covers 8 mm film. Make small spotlights or 8 mm projector. Chrome-plated barrel, knurled cap, 2 3/16" long, 11/16" dia.

No. 40,266 $3.25

(D) & (E) Quality ZOOM lenses. 33⅓—100% larger pix w/out moving projector. Hi-quality coated optics. Black & silver threaded alum. barrels. ⅞" dia.

(D) 13 to 25 mm f.l., f/1.5, 1½" long.

No. 40,873 $8.50

(E) 19 to 25 m f.l., f/1.6, 1 11/16" long.

No. 40,874 $4.50

Projection Table

Item	Number	Diagonal at:	10 ft.	16 ft.	25 ft.
(A)	40,727		2' 6"	4'	6'3"
(B)	42,128		2' 6"	4'	6'3"
(C)	40,266		1'10"	3'	4'8"
(D)	40,873	(25 mm f.l.)	1'10"	3'	4'8"
		(13 mm f.l.)	3' 8"	6'	9'4"
(E)	40,874	(25 mm f.l.)	1'10"	3'	4'8"
		(19 mm f.l.)	2' 6"	4'	6'3"

(F) Iris Shutters for Prontor Compur. Made between the years 1930 and 1960, these shutters are ideal for old camera buffs using plate roll film or 35 mm cameras. **Each shutter is only $15.95!**

Number	Diaphragm	Number	Diaphragm
42,611	2 mm-13 mm	42,614	1.5 mm–11 mm
42,612	2 mm-13 mm	42,615	none (max. open. 23 mm)
42,613	2 mm-15 mm	42,616	2 mm–12 mm

(G) Make A "Fish Eye" Lens with just lens & your dustcap. Make your own wide angle, pseudo-fisheye lens with this low-cost viewing lens & your own dustcap. Just drill hole in dustcap for your camera lens, insert rear tube of viewing lens & glue in place. 2"x1" scope gives sharp 175° image with reg. 50mm lens.

No. 42,169 $9.95

Surplus Anastigmat Lenses

For enlarging, projecting, overhead & opaque projectors. All coated precision optics. Black anodized metal barrels; some used but in good condition.

F.L.	f/No.	Coverage	Barrel Length x O.D.	Number	Price
3"	6.3	2¼x2¼"	2.5x2.6"	42,153	$12.95
3"	3.0	2¼x2¼"	1⅛x1¼"	30,234	7.50
5"	3.5	2¼x2¼"	2 5/16x2"	60,402	12.95
5¾"	5.6	3¼x4¼"	2x1¾"	41,273	18.00
6"	7.0	3¾x3¾"	6½x2"	41,982	15.00
6½"	2.8	4x5"	7¼x2⅜"	42,100	29.95

F.L.	f/No.	Coverage	Barrel Length x O.D.	Number	Price
7½"	5.0	5x5"	2⅞x3 3/16"	42,306	$21.50
7½"	7.0	5x5"	2½x2⅜"	60,695	15.00
8"	4.5	6x6"	2¾x2¾"	41,432	23.50
8"	8.0	6x6"	2½x2½"	42,560	19.50
9"	5.6	6x6"	2¾x3"	60,719	19.50

(H) Large, Wide-Angle Copy Lens. An 8¼", f/4.5 giant! Front aperture is a full 3". System contains 2 achromats & 2 meniscus correctors, all fully coated. Lens will cover at least 9" square & may go to a full 11". Black barrel, 3⅝" dia. x 3¾" long. Brand new! A fine lens for projection or viewing large negatives—even TV projection from a small screen set. OEM cost over $75. Quantity available.

No. 42,664 $17.50

(I) Raptar Lens. 8¼" f.l., f/4.5 to 32 click stops. 6x6" coverage, 2.52 O.D. x 1.975" long. Top Wollensak quality!

No. 41,484 $29.50

F.L. 8¼". Similar to above but with iris diaphragm (5 click stop f/4.5 to 16); 0.85 mm metric-threaded barrel (2.622" thread pitch); 2.718" long. Covers 6" square copy.

No. 60,723 $40.00

Big 5 Ft, f.l., f/3.3 Anastigmat Projection Lens
Coated with built-in iris diaphragm. 2⅝" O.D. 5¼" barrel. Use on optical bench or modify for enlarging. Wt. 1 lb.

No. 72,164 $15.95

19 mm f/2.0 Scanning Lens. Highly corrected, coated lens designed to be used for scanning in data transmission. 2 coated achromats in a 19 mm dia. x 30 mm length black anodized aluminum barrel.

No. 42,676 $3.75

(J) Surplus 8" F.L. f/8 Copy Lens. An excellent surplus buy, this f/8 lens affords 6x6" coverage. Perfect for use as a one-to-one transfer lens. A 4-element, double achromat in symmetrical arrangement, it has 16" lens to object distance & a 1.0" effective aperture. Mounted in a black cell, it measures 2½" long by 2½" in diameter.

No. 42,560 $19.5

(K) Micro Projection Lens. This lens is a coated 24 mm f.l., f/6.3 system with Cooke triplet in a 9 mm long x 1 mm O.D. barrel.

No. 42,370 $3.9

(L) High Quality 8 mm Movie Camera Lens. This versatile, high quality lens has coated optics. Iris diaphragm opens from f/1.8 to f/22.0. Max. length 2"; max. diameter 1.025". Mounting thread diameter ⅝", 32 tpi.

No. 41,146 $9.5

(M) 50 mm Lens Bargain. Schneider-Kreuznach-Braun Xenar f/2.8 Compur lens. Comes on bayonet mount with spring-loaded automatic aperture setting. Automatic depth of field setting & adjustable focus from 0.9 m to infinity.

No. 42,117 $20.0

(N) Telephoto Lens For Instamatics. Specially designed for Kodak Pocket Instamatic camera models 20, 30 & 40. This bracket-mounted, optically coated lens screws right to your camera tripod socket to give you telephoto capabilities not available with the standard lens. Does not interfere with electric eye. Excellent for portraits, nature photos & hobby shots. Light & compact, it mounts quickly & easily. **No. 42,544 $10.9**

(O) F/4.5 Anastigmat Enlarging Lens. Make your own enlargements. Select a lens from popular sizes of high quality anastigmats below. Coated for increased contrast. Color corrected, flat field, excellent overall definition. Click stops on iris diaphragm. Includes mounting retaining ring.

Number	f.l.	Coverage	Price
30,181	50 mm	35 mm	$26.50
30,182	90 mm	2¼"x2¼"	32.50
50,289	105 mm	2¼"x3¼"	41.50
30,183	135 mm	3¼"x4¼"	45.00
42,652	163 mm	5"x7"	47.50

Surplus 4¼" f/4.5 Copy Lens. Distortion-free 9"x9" coverage. Special flange mounting. **No. 42,635 $8.9**

"All About Telephoto Lenses". Learn about taking long distance photos through telescopes, binoculars; best types of filter, exposure factors, film & more. 16 pages about telephoto systems *you* can build!

No. 9036 $1.9

(P) Auxiliary Lens Set . . .
Originally $20, this three-piece set is truly a bargain. Designed to fit Cine-Kodak Instamatic movie cameras

it includes bracket with viewfinder lens, 1 wide angle lens and 1 telephoto lens. Snap over camera lens without disturbing diaphragm settings.—The **Telephoto makes a dandy 2X pocket telescope!** Adapt them to your own camera. Leather case also included.

No. 42,144 $3.95

(Q) 45 mm Zeiss-Tessar Lens . . . ½ Price!
This f/2.8 lens is a real bargain. Famous Zeiss quality can be adapted for use as enlarging lens. Originally $90.00!

No. 42,201 $24.95

(R) Reverse Adapters Turn Your Ordinary Lens Into A Close-Up Lens!
Now you can use your own lens for close-up photography! This adapter uses the filter ring threads on your lens to permit you to mount it backwards on your camera. Brings ordinary lens approximately 1" from subject. Works on all SLR's.

Camera	Filter Ring Thread Dia.	Number	Price
Pentax	49 mm	42,373	$4.95
Minolta	55 mm	42,376	5.95
Nikon	52 mm	42,377	5.95
Canon	55 mm	42,378	8.95

"T" Compatible Adapters

Camera	Adapter	SLR Match	Number	Price
Pentax	T-1 (PC)	Praktica,Cosina, Asahi Pentax Series, Fujica (not K models)	42,832	$ 9.95
	T-16(PK)	Pentax K&M Series, Chinon	42,833	15.95
Minolta	T4-MSR	All SLR Minolta models	42,834	12.95
Nikon	T5-NI	Nikon, Nikkormat	42,835	12.95
Canon	T6-CF	Canon	42,836	17.95
Olympus	T-15 OM	Olympus OM 1	42,837	21.95
Leica M Series	T-17	(Screw Mount)	42,838	16.95

Aerial Camera Filter. U.S. Gov't. surplus filter 100 mm in diameter & 10 mm thick. Red with shaded vignetting pattern in the center to produce even exposures on large format film. Mounted in black anodized aluminum but can be easily removed. Also makes a dandy viewing window, darkroom filter, or even a large coaster! Brand new!

No. 42,672 $3.50

163 mm f/4.5 Enlarging Lens. Take advantage of a great surplus buy! This coated lens includes a screw-on mounting flange & will cover 5"x7" negatives. Built-in iris diaphragm ranges from f/4.5 to f/32.0. Ideal for large format enlargement. Comparable lenses sell for $200!

No. 42,652 $47.50

80 mm Zeiss Lens System for mounting in your own camera lens barrel. Front & rear elements. Shutter not included.

No. 42,200 $45.00

Equipment for Specialized Photography
For special adapters that let you capture images through telescopes and microscopes, see pages 16 and 42.

(S) 16 mm DeVry Movie Projector
Excellent for film editing or projection demonstrations. These hand-operated silent film projectors were used by a correspondence school for student lessons. Used, but reconditioned. Includes 50 W, 120 V AC lamp, condenser system & projection lens.

No. 72,366 $19.95

(T) Binocular/Monocular Telephoto Camera Adapter
Turns your binocular or monocular into a telephoto lens! Mounts to camera tripod with standard ¼"-20 screw. Rubber adapter mates binocular or monocular to still or movie cameras with standard tripod sockets. Adjustable aperture & shutter speeds. Binoculars must have center pins; monoculars require hinged lugs or threaded sockets.

No. 72,404 $19.95

(U) 2X Stereo Viewer
This stereoscope is ideal for engineers, geologists and others who use vertical aerial photo maps, infra-red aerial photos for ecological studies and 3-D drawings. Prints up to a full 5"x5". Fine for making linear photo measurements. Interpupillary range is 55 mm to 80 mm, magnification is 2X. Fitted with folding legs adjustable for interocular separation. Includes 4½"x7¼" permanent case.

No. 42,118 $29.95

(V) Powerful 4X Pocket Stereo Viewer
Rugged cast aluminum unit with attractive crackle finish has 50 mm to 75 mm interpupillary adjustment. Legs lock firmly and fold away for storage. Comes complete with soft-side lines & protective case. Excellent for study of small photographs and for field work.

No. 42,651 $27.85

(W) Photo Retouch Kit
Touch up old family portraits, photos or color slides! This kit will open up a whole new dimension of photography to you & stimulate your imagination as well. Retouch old yellowing portraits or just add more color to vacation pictures. Kit comes complete with built-in mixing palette, 2 watercolor brushes, 1 bottle of anti-static cleaner, 1 bottle of detoning wetting agent, 1 bottle of masking agent & solvent, 4 bottles of intensifier dyes (yellow, cyan, magenta, gray), 3 tubes of photo-spotting opaque (white, dark gray, black), 1 spray can of matting agent & detailed instructions. Everything you need!

No. 61,227 $29.95

(X) Photo Developing & Enlarging Kit For The Beginner
Now you can afford to develop and "blow up" your favorite black & white photos! With the *preset* enlarger, even the beginner can make up to 3½"x5" prints from 35 mm, 110, 126 & 127 film. You don't need a darkroom, a closet will do! Complete 18 piece kit includes all you need: U.L. listed & C.S.A. approved enlarger (110–120 V, 60 Hz), adjustable film developing tank, 3 trays for developing, acid fixing & rinsing, and a graduate thermometer for maintaining accurate solution temps. 7½ W darkroom amber light, 3 negative carriers, 2 masks, 2 Kodak Tri-Chem Packs, 25 sheets of glossy paper, 2 clips and step-by-step illustrated instructions also included.

No. 80,245 $39.95

Phosphorescent Darkroom Tape
Designed by professional photographers especially for darkroom use! Perfect for labeling chemicals, trays, tanks, electrical switches, timers & dangers in darkroom & lab. Waterproof—safe phosphorescence won't fog most film or papers. Pkg. of two ¾"x24" rolls.

No. 42,083 $3.25

(Y) Front Viewing Screen. Ideal for sales demonstrations, displays & school visual aids. 10"x13" screen shows images in daylight. Only 8 oz., it goes anywhere.

No. 72,285 $4.95

(Z) Waterproof Protective Pouch
Total protection against shock & moisture for optical equipment & other fragile or breakable valuables. 11"x14¼" heavy gauge vinyl. Inflates & will float with up to 10 lbs. Includes shoulder strap.

No. 72,417 $21.95

Attention Photographers! Don't let dust ruin your prints! See the new Static Neutralizer on page 80.

You can charge your purchase three ways:
VISA • Master Charge • American Express
See page 50C for details

Photography

(A) Deluxe 6 X 6 Inch Opaque Projector

***Enlarges Up To 7 Ft. *Projects Up To 12 Ft. Away**

Boasting features and performance of far more expensive models. this unit will accept any picture or print from a book, magazine. newspaper or printed matter up to 6 x 6" in size & enlarge it up to 5, 6 or 7 ft. in size. Projects enlargement on screen or wall from 30" to 144" away. Useful for commercial artists, photographers, sign painters, sales managers, etc. Teachers can use it to enlarge maps for study, art class sketching or class review of articles. Comes equipped with cooling fan; welded steel body louvered for cool operation; projection lens; plate glass mirror; curl-free copy slide tray and a feed through swtich on an 8 ft. UL listed cord for 115 V AC. Easy to use, simply place two 200 W bulbs, household type (not incl.), inside unit. Plug in cord and place copy in slide tray. Copy larger than 6x6" can be projected in sections. Works best in very dark rooms. Wt. 12.2 lbs.

No. 80,217 $99.95

(B) Imported West German Opaque Projector

This quality import projects clear, brilliant black & white or color photos, diagrams, paintings, drawings, books & other subjects up to 5"x5" in size. Enlarges up to 84"x84" in darkened room. Flat topside glass stage accepts copy easily, holds it flat with magnetic platen, or lets you turn unit upside down to project portions of large subjects. Precision 230 mm, f/3.5, anastigmatic lens gives maximum brightness & full field focus. Focuses with simple turn of lens. 150 watt quartz-halogen lamp with internal reflectors gives bright, sharp images. Quiet, powerful, turbo-blower keeps projector running cool. 5½ ft. line cord & instructions incl. 115 V, 60 Hz. Only 8¾ x 6 x 12½". Weighs just 11½ lbs.

	No. 72,443	**$229.95**
Extra Lamp for above Projector.	**No. 41,374**	**8.95**
Black-grained vinyl carrying case.	**No. 71,444**	**29.95**

Make Your Own Overhead Projector

***Matched Optics Kit *Diagrams**

Save by building your own, large format 10" x 10" overhead projector from our optics kit. Kit includes: 11⅛" sq., 5½" F.L. double Fresnel condenser lens (plastic); two 88 mm dia. meniscus lenses (14" EFL, f/3.5) & detailed, fully illustrated instructions.

No. 70,966 $19.95

To complete Projector, you also need wood, power cord & the following low-cost items.

500 watt Quartz-Iodine Lamp	**No. 40,779**	**$21.95**
Socket for Above Lamp	**No. 40,781**	**4.75**
4 x 6" Mirror	**No. 60,247**	**1.95**
Switch	**No. 75**	**3.95**
Reflector	**No. 566**	**1.20**
Motor & 6" Fan	**No. 60,689**	**7.95**

(C) Turn Magazine Pictures Into Beautiful Slides In Minutes

No camera, machines or chemicals are needed. Full color slides in minutes from pictures taken from coated-paper magazines or books. Kit makes up to 20 standard 2x2" slides, and includes 10 mounts, viewfinder, special "film", burnishers, sponge & instructions. **No. 41,794 $ 6.95**

Deluxe Kit: 75 slides **No. 41,793 19.95**

(D) Type Your Own Slide Titles

Put on a professional 35 mm slide show with titles you can type yourself. It takes just a few seconds and you get great results. Simply place stencil material in typewriter, center under template, type, then cut & mount. Kit has 30 stencils, 30 slide mounts, template & instructions. A natural for classrooms & sales meetings! **No. 42,263 $5.95**

Cooling Motor With 3½" Fan Blade

Prolongs life of projector bulbs and allows you to use brighter light. Runs quietly on 115 V, 60 Hz horizontally or vertically, 3¼"x2¼". **No. 101 $3.95**

Build-It-Yourself Books

"How To Build Slide Projectors" Edmund & Brown. 20 pp. pamphlet on 35 mm slide projector optics & construction. Designs to build low-cost projector. **No. 9014 $1.00**

"How To Build Opaque Projectors". Detailed design of 8 projectors. Covers optical theory, lighting systems & construction. Plans included. 18 pp. **No. 9314 $1.50**

16 Page "Optical Drawing Devices" Book. Build a drawing camera, drawing projector, camera lucida. Photographic tips included. **No. 9059 $1.30**

"Building A Condenser And Enlarger". 16-page booklet filled with directions for building a fine enlarger for negatives of any size. Parts list included. **No. 9038 $1.00**

Special Projection Screen Material

Lens screen: new transmission/projection screen material made of light-spreading transparent microcells, permits daylight rear projection presentations. Ideal for sales meetings, conferences, lectures, classrooms & home showings. Elastic and flexible, it rolls with no creases. No "hot spots", non-yellowing and unaffected by temperature & humidity. Reversible. Instructions included.

1 Ft. x 1 Ft.	**No. 70,934**	**$ 5.95**
3 Ft. x 3 Ft.	**No. 70,935**	**38.95**
6 Ft. wide sheet No. 2508	**$26.95/running ft.** (2 ft. min.)	

Cyclorama Cloth For Large Screen

Used by movie industry for background projection. Canvas-like, flameproof; ideal for large front projection screens. Approx. 102" wide. Minimum order 1 yd.

No. 2515 $9.95/running yd.

Glass Rear Projection Screen

Replace ground glass with this gray glass screening. Provides extreme contrast, sharp clear pictures, better diffusion.

20x24x⅛".	**No. 85,002**	**$64.95**
Size 10" x 12"	**No. 70,047**	**19.95**
Size 5" x 6"	**No. 40,137**	**7.95**
Size 4" x 4"	**No. 40,138**	**4.95**
Size 5⅞" x 8$^{3}_{16}$" (plastic)	**No. 42,495**	**1.25**

(E) Flashlight Arrow Pointer.

Flashlight-style pointer useful for sales meetings, exhibits, lectures or tours. Arrow shaped light pinpoints interesting features. **No. 60,117 $8.00**

Replacement Bulb: **No. 40,383 2.00**

Need Help With Your Selection? Contact our Customer Service Department

Magnets

(A) Mighty Magnet For Sport Or Industry
• Strong! Lifts Over 150 lbs.! 101 Uses!
• Coated For Protection From Chemicals

Go treasure hunting on the bottom of a bay, river, lake or ocean. Tie a line to this powerful lightweight magnet & drop it over the side. Your treasure haul can be anchors, fishing tackle—all kinds of ferrous metal valuables.

Many industrial & maintenance uses—pick up nails, scrap metal, nuts & bolts from driveways, parking lots, garages & workshops; retrieve tools from dip & coolant tanks; group several on rods for conveyor belt sweeping, and more. Oil well drillers even use them to retrieve broken drill heads!

This Edmund exclusive has 6 strong ceramic magnets stacked for strength with steel pole pieces and an aluminum frame & bar handle for easy carrying. Everything but the pole pieces is covered with ⅛" thick, special heat-fused Poly-vinyl Chloride that protects the magnet from corrosion by chemicals, acids, alkalis, plating solutions & some organic solvents. Bright orange PVC coating (easily spotted underwater) is smooth, seamless & resilient. Won't chip, peel or harden. Especially good on flat ferrous metal objects—its multiple uses make it pay for itself many times over.

150 lb. Pull Magnet (wt. 2 lb.) **No. 71,135 $19.95**

75 lb. Pull Magnet: as above but with 3 ceramic magnets, 1 11/16"x3¼" face; wt. 1 lb. **No. 71,150 $13.95**

(B) 150 Pound Lift Ceramic Magnet
Equipped with a stainless steel carrying handle, this powerful magnet weighs only 1 lb. but lifts in excess of 150 lbs.! It's made of 4 ceramic magnets sandwiched in a series between 4 steel plates that direct and concentrate magnetic flux for maximum pull. Convenient handle fits in the palm of your hand for easy carrying of the magnet. Terrific for a wide range of sport, hobby, & industrial uses including "magnetic fishing", tool retrieval & shop clean-up. It measures only 1" x 1¼" x 4⅜" and fits easily in tool box, work bench drawer or jumpsuit pocket. Includes a hole which is drilled to accept a ¼" screw.

150 lb. Lift Ceramic Magnet. No. 42,318 $12.95

(C) 95 Pound Lift Handle Magnet
This amazing magnet only weighs about 9 oz., yet is capable of lifting up to 95 lbs. A mighty midget that's great for scrap metal and tool recovery, it has a metal handle mounted on top of 2 ceramic magnets that are sandwiched between steel plates. The handle features a detent for secure, no-slip attachment of retrieval line. Fits easily in the palm of your hand while attracting all kinds of ferrous objects. **No. 42,095 $6.95**

(D) 150 Pound Lift Lever-Release Magnet
This powerful magnet has a quick cam-action lever that let's you drop a 150 lb. steel block with just a pull of your thumb. Made of rust-resistant plated steel with 3 precision-ground lifting surfaces & 2 ceramic magnets, it has a stainless steel handle & lift bale. 4½"x1¼"x3⅛".

No. 42,447 $15.95

Lifts 64 Times Its Own Weight!

Need extreme magnetic strength in a small, lightweight size? Try Super Magnet with 100 times the pull of an Alnico of similar size & shape. Possibly the strongest magnet available today! Capable of lifting 50 to 75X its own weight, this tiny giant can open the door to product designs never before possible. Made especially for Edmund Scientific by Crucible Magnets from rare earth samarium cobalt materials, it offers a one-of-a-kind superiority to all magnets presently available. Expensive? Not really, when you consider its unbelievable lifting and holding power. Size: .750± .015" OD x 430± .051" ID x .250" thick. Weight: 1½ oz. Gauss: 8,000. Lifting Power: approx. 6 lb. **No. 30,730 $29.95**

Edmund's Electromagnet . . . Lifts Over 500 lbs.
Easily Handles The Most Demanding Tasks

A battery-powered giant, this electromagnet is your answer to difficult plate or pipe handling, scrap separation, ferrous traps, moving heavy structurals, ferrous contaminant removal or small parts handling. Though tiny, this strong magnetic device provides rigorous lift and no-lift (or drop) capability using current provided by 2 size "D" flashlight battery cells (not included). It's deactivated by disconnecting power. Strong cold rolled steel with eye bolts at each end. 3" diameter; 3 lb.

No. 71,936 $49.95

200 lb. Lift Electromagnet. Similar to above but operates on one 1½ V flashlight batt. Great for school science classes, ferrous traps & parts separation. 2¼" dia., instructions incl. **No. 60,435 $29.95**

500 lb. Lift

200 lb. Lift

MAGNET HEADQUARTERS USA . . . Save Up to 80%

Note: Magnets cannot be shipped by air due to International Air Transportation Association regulations.

Buyers Guide
TO MAGNETS

How Do We Measure Magnetic Pull?

Magnetic pull is affected by the air gap between a magnet and the object being lifted. Air gaps, in turn, are affected by surface finish or curvature which prevent intimate contact. In testing for magnetic pull, a ground steel plate is placed on a scale and the magnet, engaging the ground surface of the plate, pulls upward vertically until the magnet "breaks free." The indicated weight at the time of separation is subtracted from the total weight of the plate to obtain magnetic pull. For example, a 20 lb. plate which indicates 8 lbs. at the instant the magnet breaks free means a magnetic pull of 12 lbs. To achieve maximum pull, the object's center of gravity must be in line with the magnet's vertical axis to eliminate the tendency for the object to rotate when lifted.

Types and Uses of Magnets

Alnico magnets are blends of aluminum, nickel, iron and cobalt. They are quite strong and have a high degree of stability. Ceramic magnets are basically ferrites and are very resistant to demagnetization. Both types have many uses in the home, school, shop, office and lab. They're great for bulletin boards, motor construction, games and pick-up tools. Their educational uses range from the study of magnetic fields by science students to fascinating a child for hours!

Looking For Bargains in Magnets?

You've found them. We offer you savings from 30 to 80% on all sizes and shapes of magnets. Buying government surplus, manufacturers' overruns and large quantity purchases enables us to pass the savings on to you.

Magnets

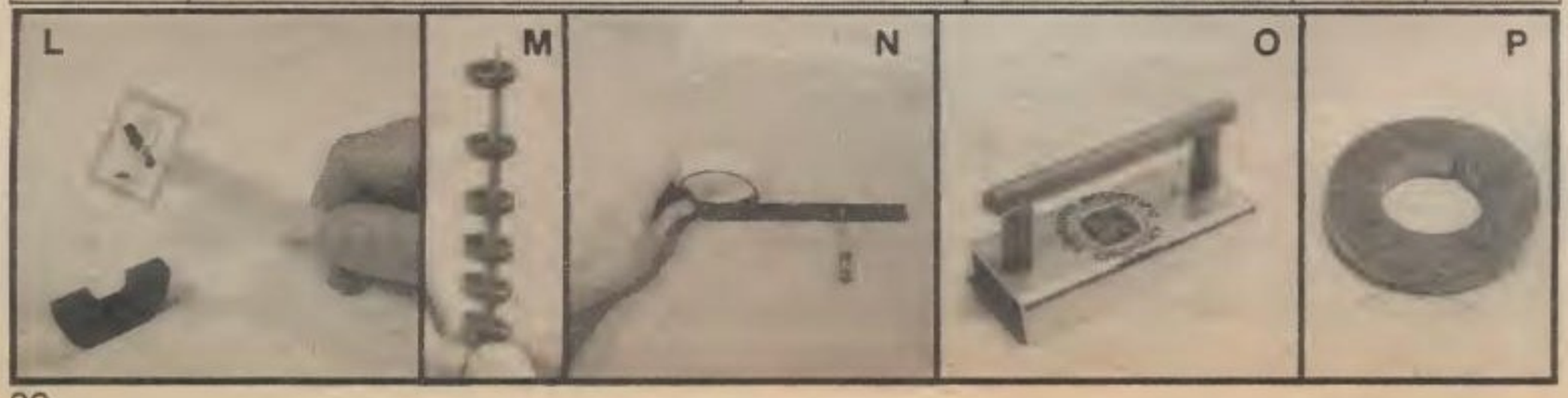
Alnico Magnets, blends of aluminum, nickel, iron, & cobalt, are strong and stable. (**NS**=Not Shown)

(Pix)	Shape	Size (inches)	Thickness	lb. Lift	Comments	Qty.	Number	Price
NS	Bar	6 x ¾	¼"	1⅛	NDEA specs. (CCSSO #2340)	1	40,421	$7.95
NS	Cast Bar	⅞ x 3/16	⅛"	⅛	Has N&S Poles	16	P-40,860	5.95
(A)	Bar	2 x 5/16	5/16"	⅓	Alnico	2	P-42,421	3.00
(B)	Rectangular	¾ x ⅞	13/32"	1	Channel on one side	2	P-42,187	1.75
	Rectangular	1⅜ x ⅞	11/16"	8	Channel on one side	2	P-41,887	3.25
	Rectangular	7/16 x 3/16	1/8"	⅛	Two Corners beveled	100	P-41,667	3.50
(C)	Square	½ x ½	¼"	1¼	Small & powerful	8	P-41,787	3.25
(D)	Disc	15/16	9/32"	3⅛	Alnico	2	P-40,419	8.95
NS	Cylinder	⅛ dia.	1 5/16"	⅜		10	42,828	3.00
NS	Cylinder	⅜ dia.	5"	⅞	Alnico II-good demonstrator	2	P-60,131	10.95
NS	Cylinder	¼ dia.	1¾"	2⅛	Centerless ground-Alnico V	2	P-40,418	2.95
NS	Cylinder	3/16 dia.	1"	⅜	Centerless ground-Alnico V	2	P-30,724	1.50
(E)	Cylinder	21/32 dia.	9/16"	1½	Small dia. 17/32"	8	P-42,426	3.00
(F)	Horseshoe	1⅛ x 15/16	⅜"	1¼	Slanted Faces	2	P-40,275	3.75
	Horseshoe	¾ x ¾	½"	8	½ x ¼' pole faces-Alnico V	2	P-42,295	3.50
	Horseshoe	1 1/16 x 1 1/16	13/16"	1½	Set of 2, diff. sizes	2	P-42,462	2.00
(G)	Horseshoe	⅞ x ⅞	7/16"	4	Tiny Alnico	2	P-30,564	1.50
(H)	Ring	1	5/32"	½	¼' hole-mag. across dia.	8	P-40,846	2.25
(I)	Ring Gap	17/32	7/16"	3	⅛" gap, 7/16" hole	4	P-40,964	2.75
	Ring Gap	17/32	½"	3	7/16" gap, meter magnet	4	P-41,998	3.00
(J)	Channel	1 x 1	⅜"	3	Alnico V	2	P-42,134	2.25
(K)	Break-off	⅜ x ⅜	7/32"	3/16		12	P-42,188	2.25
	Break-off	½ x ⅝	⅜"	11/16		10	P-42,304	3.75
NS		18-piece assort approx. 18 oz.			Excellent for bulletin boards		P-60,581	5.50

Strong, Pocket-Size Imported Magnets

One of the strongest, pocket size permanent type magnets we've seen. Alcomax is similar to Alnico (aluminum, nickel, cobalt, plus iron) but more efficient. You'll find hundreds of uses for these handy and attractive magnets in the home, school, shop, office & lab. They're perfect for bulletin boards, pick-up tools and experimenting. Your choice of horseshoe, power or pot type, each has a bright red finish and a plated keeper. Imported from England.

Wt. (Oz.)	Magnet Size (Inches) (A)	(B)	(C)	(D)	(E)	(F)	Pull (lb.)	Avg. Gauss	Comments	Number	Price
1	1 3/32	5/16	1	5/16	¼	⅞	4	1400	Alnico V, U-shaped	41,946	$ 3.95
2½	1 5/32	¾	¾	¾	5/16	1 3/16	6	1600	Alcomax; U-shaped	41,947	12.95
5	1½	1	1	1	¾	1½	15	2300	Alcomax; U-shaped	41,948	17.95
8	1¾	1⅛	1⅛	1⅛	⅞	1¾	25	2600	Alcomax; U-shaped	41,949	24.95
13	2¼	1¾	1⅜	1¾	1⅜	2¼	50	3000	Alcomax; U-shaped	42,338	39.95
25	2¾	2¼	1⅝	2¼	1⅝	2¾	70	3000	Alcomax; U-shaped	42,339	79.95
51	3⅛	3¼	2⅛	3¼	1⅞	3⅛	100	3000	Alcomax; U-shaped	42,340	159.95
1⅔	Ht. ¾" Dia. 13/16"						5	1500	Alcomax; pot; tapped	41,952	6.95



(L) Trace Magnetic Fields

Magnaprobe demonstrates a magnetic field's 3-D nature easily & accurately. Unit has tiny, sensitive, color coded bar magnet that pivots on a rotatable bearing mount to indicate magnetic fields on 3 axes. Only 4"x1"x1½" in size. **No. 42,217 $18.95**

(M) Floating Magnets

Put a non-magnetic stick through the hole in these ring magnets. Arrange the poles opposite each other and one magnet will float in the air above the other. The basic principle may be used in the "trains of the future". Fascinating to play with. Children love them. Educational.

(25) ½" dia.	**No. P-41,990**	**$2.25**
(100) ½" dia.	**No. P-41,991**	**6.25**
(10) 1⅛" dia.	**No. P-41,988**	**1.35**
(100) 1⅛" dia.	**No. P-41,989**	**10.95**

Ceramic Magnets

Magnet with pole pieces lifts 40 lbs; without pole pieces 3 lb. 10 oz. ⅞"x⅞"x⅜".

Pkg. of 2 w/4 pole pieces	**No. P-40,818**	**$2.50**
Pkg. of 12 w/24 pole pieces	**No. P-60,528**	**12.75**

Flexible Magnetic Strip

Mounts easily, pulls just enough to give a good seal, yet permits easy opening and closing. 1400 Gauss. Strip can be cut into smaller utility magnets.

Brown Only

1/16 x 0.18 x 12"	**No. 60,092**	**$1.25**
11/16 x ⅛ x 48"	**No. 61,251**	**4.95**
31/32 x ⅛ x 12"	**No. 61,124**	**1.95**
¼ x 3/16 x 120"	**No. 42,677**	**2.95**

(N) Flexible Magnetic Tape

This 1/16" thick tape is for car dash, medicine cabinet, bulletin board or workshop. One side is magnetic, the other adhesive. Roll is 30" long & 1" wide.

No. 60,208 $3.49

Flexible Magnetic Sheets

This rubberized flexible material is 1/32" thick. Easily cut with scissors to any shape. Use to hold small ferrous metal parts before assembly. Widely used for making temporary auto signs. Just place on car door and it stays in place.

6 x 36" sheet.	**No. 61,011**	**$13.75**
3 x 3" sheet, Pkg. of 2	**No. P-40,859**	**2.25**

(O) 25 lb. Pull Channel Magnet

This 25 lb. pull magnet is excellent for holding maps and charts to ferrous walls and boards. The channel magnet is constructed of an oriented ceramic magnet which is bonded inside a U-shape channel. A convenient handle lets you carry things with ease. You can even tie it to a cord and go "magnet fishing". It's only 3⅛" long. Fits right in your pocket!

No. 40,847 $2.50

(P) Unusual Magnet

Sintered Alnico Ring Magnet (Isocotropic Lodex 42) that is magnetized across its diameter! Designed for the permanent magnet fields of small motors. Similar magnet effects of a bar magnet except with closed structure. Has north and south pole on its diameter. Lifting power ½ lb. 1" dia. 5/32" thick, ¼" hole. Pkg. of 8.

No. P-40,846 $2.25

Iron Filings.

Demonstrate a magnetic field using iron filings. 1 lb. pkg. **No. 60,176 $2.50**

Attention Manufacturers . . . We buy overruns and odd lots of magnets. Contact us about your surplus.

Save Energy . . . Save Gasoline . . .
SHOP BY MAIL
See page 33 for more energy-saving ideas.

(H) Coated Ceramic Ring

Very clean ferrite ring magnet with circular orientation & epoxy coating. High density; strength: 90 Gauss at 1½". 10 lb. lift. 2⅞" dia.; ⅝" thk.; 1¼" hole dia. Originally designed to activate pacemakers. **No. 42,310 $2.75**

(I) Strong Ceramic Magnet

***Great for Demonstrations *35 lb. Pull**

Only 2" in dia. but what power! This round ceramic magnet in a steel case is perfect for schools and hobbyists. A brass screw eye in the center lets you hang it, attach it to pulleys or use it as a handle. You'll find dozens of ways to utilize this little "strongman".
No. 42,098 $6.95

(J) 2 lb. Mighty Might

A fine quality surplus cylinder magnet with a washer type keeper. Many uses in home, shop, & industry. Made of Alnico VI, this beauty will lift up to 75 lbs. Dia.: 2 1/16". Thickness: 1⅜". Center hole dia. 1⅜".
No. 42,077 $9.50

(K) Super Magnet For Research

Samarium cobalt alloy, 1x1x¼" sq. Highest energy per unit volume available in permanent magnets. Properties: Hc Normal Coercivity ~7000 Oersteds; Br. Residual Induction ~8000 Gauss: (BH) max. Energy Product ~16 mega Gauss Oersted. Wt. .08 lb.
No. 30,779 $29.95

Rectangular Ceramic Magnets

These permanent ceramic magnets are basically ferrites. They are made from iron oxides and other elements which are resistant to demagnetization. **40 lb. lift magnet** (1⅞ x ⅞") includes 4 pole pieces. Pkg. of 12.
No. P-60,528 $12.75

4 lb. lift magnet with channel & hook. (1 x 1½") 3/16" thick. Pkg. of 4. **No. P-42,368 $ 2.25**

Alnico Lift. Blend of aluminum, nickel, iron & cobalt, these magnets are excellent for small lifting chores. Lift up to 7 oz. 11/16" x ½" x ⅜". Pkg. of 10.
No. P-42,508 $3.00

Ceramic Disc. Rubberized magnets lift up to ¼ lb. Use to hang up things around home or in the car. Each 13/16" x ⅛". Pkg. of 50. **No. P-42,506 $3.00**

Miniature Rubberized Ceramic. Ideal for marking positions on magnetic charts, maps & graphs. Round (approx. 7/32" dia. x 5/32" thick) or oval (approx. 11/32" x 7/32" x 3/32" thick), sizes in pkgs. of 100.
Round: **No. P-42,516 $1.95**
Oval: **No. P-42,518 2.95**

Ceramic Type Lifts to 1/16 lb. Thousands of uses in the lab, shop or home. ¾" dia., ½" thk. Pkg. of 100 at a great low price. **No. P-30,802 $3.95**

Ceramic Bonanza Group in choice or 3 styles & packages in quantity to save you even more. ⅜" dia., ¼" thk. 3/16 lb. lift.
Pkg. 100 **No. P-42,582 $ 5.00**
¾" dia., ½" thk., 1/16 lb. lift.
Pkg. 1000 **No. P-42,581 35.00**
⅜" dia., ¼" thk., 3/16 lb. lift.
Pkg. 1000 **No. P-61,147 45.00**

Magnetic Balls Jump, Wiggle, Defy Gravity

Play loony marbles! 4 rubberlike magnetized balls roll in crazy direction. Pkg. of 4. **No. P-60,508 $1.95**

Edmund Scientific has a long and proud history of service to hobbyists, serious amateurs and professionals in science and science-related fields. That's why we always look for ways to make shopping from Edmund easy. And that's why we think you'll be pleased to read about our 30-Day Limited Warranty – Satisfaction Guaranteed or Your Money Back . . .and our New 1-Year Limited Telescope Warranty! See Page 50-B for details.

Ceramic Permanent Magnets are basically ferrites. Made from oxides of iron & other chemicals, they are very resistant to demagnetization. (**NS**=Not Shown)

(Pix)	Shape	Size (inches)	Thickness	lb. Lift	Comments	Qty.	Number	Price
(A)	Disc	⅜"	⅛"	1/16		25	P-41,986	$ 1.75
	Disc	⅜	⅛	1/16		100	P-41,987	5.75
	Disc	½	3/16	⅛		25	P-40,820	2.25
	Disc	½	3/16	⅛		100	P-40,819	7.50
	Disc	13/16	⅛	⅛		25	P-41,992	3.00
(B)	Cylinder	¼	⅛	1/16		100	P-42,164	2.50
	Cylinder	¼	⅛	1/10		1000	P-42,165	19.95
	Cylinder	¼	¼	1/16		100	P-42,162	3.50
	Cylinder	¼	¼	1/10		1000	P-42,163	29.95
(C)	Ring	½	⅛	⅛	¼" center hole	25	P-41,990	2.25
	Ring	½	⅛	⅛	¼" center hole	100	P-41,991	8.25
	Ring	¾	1/16	1/16	¼" center hole	2	P-40,555	1.80
	Ring	1⅛	⅛	⅜	¼" center hole	10	P-41,988	1.35
	Ring	1⅛	⅛	⅜	¼" center hole	100	P-41,989	10.95
	Ring	1¼	3/16	7/16	3/16" center hole	4	P-42,159	1.75
	Ring	1¼	3/16	7/16	3/16" center hole	25	P-42,160	8.50
	Ring	1½	3/16	⅝	3/16" center hole	4	P-40,869	1.95
	Ring	2⅞	¼	1⅝	1" center hole	1	40,482	2.75
	Ring	2⅞	⅝	10	1¼" center hole—coated	1	42,310	2.75
	Ring	3 5/16	7/16	5	1¼" center hole	1	42,671	2.25
(D)	Ring	1¼	⅜	¾	3/16 x ⅜" slot	4	P-42,157	2.25
	Ring	1¼	⅜	¾	3/16 x ⅜" slot	25	P-42,158	11.50
(E)	Rectangular	⅛ x 3/16	¼	⅛		20	P-42,242	2.75
	Rectangular	⅛ x 3/16	¼	⅛		100	P-42,243	10.50
	Rectangular	¾ x 5/16	¼	5/16		25	P-42,425	3.00
	Rectangular	1⅜ x ¼ x 5/16	¼"	⅛	N&S Design	10	P-42,762	4.50
(F)	Rectangular	1 x ¾	3/16	⅛	3/16" center hole	10	P-40,637	1.50
	Rectangular	1 x ¾	3/16	⅛	3/16" center hole	100	P-60,347	11.25
	Rectangular	1 x ¾	3/16	⅛	3/16" center hole; with channels	10	P-41,795	2.25
	Rectangular	1 x ¾	3/16	⅛	3/16" center hole; with channels	100	P-60,944	17.50
	Rectangular	1 5/16 x ⅜	⅛	1/64	⅛" center hole end to end polarity	10	P-30,831	1.50
(G)	Rectangular	1 x 1½	3/16	4	With channel and hook	4	P-42,368	2.25
NS	Rectangular	1⅞ x ⅞	⅜	3⅝	Without pole pieces	2	P-41,798	1.50
NS	Rectangular	1⅞ x ⅞	⅜	3⅝	Without pole pieces	12	P-41,799	7.50
NS	Rectangular	1⅞ x ⅞	⅜	40	4 pole pieces included	2	P-40,818	2.50
NS	Rectangular	1⅞ x ⅞	⅜	40	24 pole pieces included	12	P-60,528	12.75
NS	36-pc. assortment						P-42,296	5.50

Comprehensive Magnet Handbook. Permanent Magnet Design and Application handbook by Lester R. Moskowitz of Philadelphia's Spring Garden College is a practical guide for students, design & QC engineers & purchase agents. Covers all materials, circuits, & applications used today. Incl. charts, tables & lists. Hardback, 408 pp. **No. 9536 $39.50**

"Magnetism & Its Effects On The Living System"

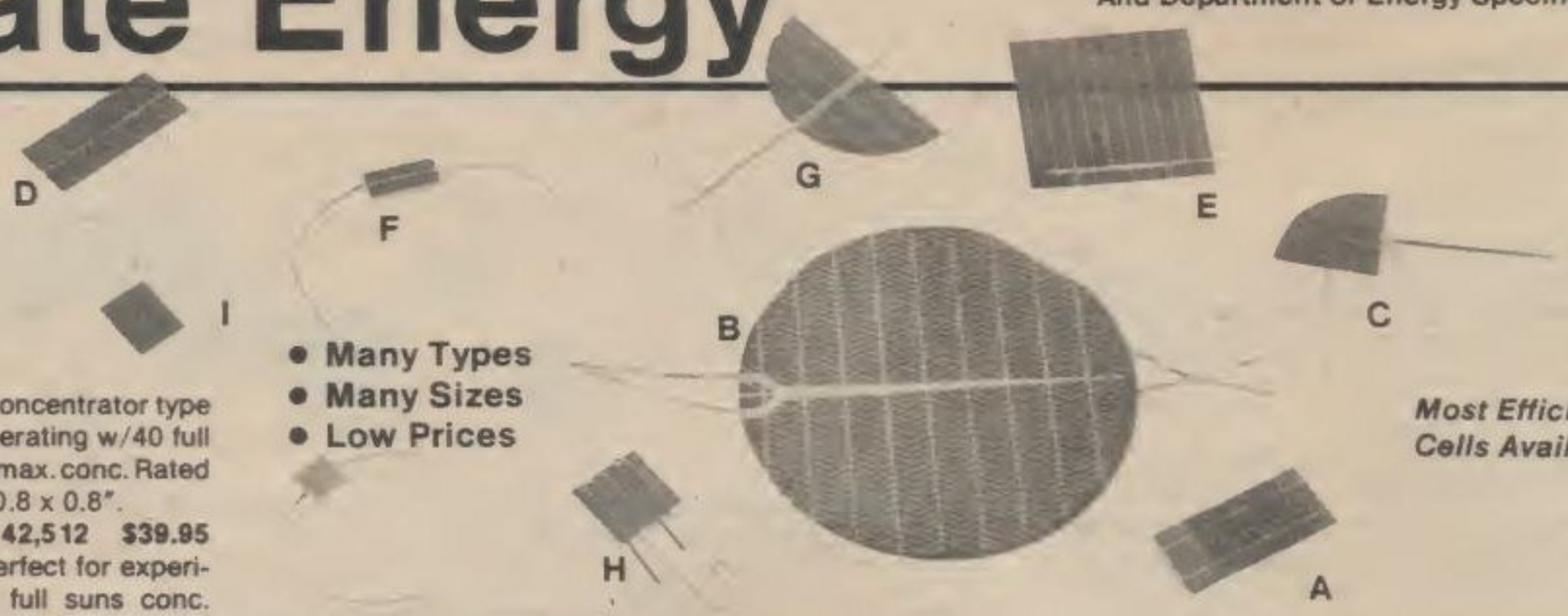
Written by scientists Albert R. Davis & Walter C. Rawls Jr., this book discusses the new field of Biomagnetics. Designed for the student & layman, it describes advances made in using magnetism to program improved intelligence & long life. Hardback, 132 pages. **No. 9503 $8.50**

Magnetic Fun & Learning

Hours of fun for children. They can learn & demonstrate attraction & repulsion or do magnetic tricks. An Alnico-V Bar Magnet with poles marked & painted . . . A blend of iron, nickel, cobalt, & aluminum alloy. 6x¾x¼" thk. Fulfills specs of CCSSO Purchase Guide for magnets #2340. **No. 40,421 $7.95**

Alternate Energy

All Panels Meet U.S. Jet Propulsion Laboratory And Department of Energy Specifications.



- Many Types
- Many Sizes
- Low Prices

Most Efficient Cells Available!

New High Efficiency Solar Concentrator Cells

40X Concentrator Solar Cell. Highest concentrator type available commercially. Capable of operating w/40 full suns concentration. Produces 1.5 W @ max. conc. Rated 0.125 A @ 1X conc. 0.45 V. Wt. 2 oz. 0.8 x 0.8".
No. 42,512 $39.95

10X Concentrator Cell (not shown). Perfect for experiments. Capable of operating at 10 full suns conc. Produces 0.35 W. Rates .125 A @ 1X conc., 0.45 V., Wt. 2 oz. Size 0.08 x 0.8". **No. 42,510 $21.95**

20X Concentrator (not shown). Capable of operating at 20 full suns conc. Produces .75 W. Rates 0.125 A @ 1X conc., 0.45 V. 2 oz., 0.8 x 0.8". **No. 42,511 $26.95**

(A) New! Solar Cell Microgenerators.

Type 1 Kit. Ideal for charging 1.5 V rechargeable batteries. Incl. Solar cell array with color-coded leads & separate blocking diode. Delivers 40 mA @ 1.5 V in full sunlight with diode. **No. 42,466 $16.50**

Like 1, But Without Diode. Great for charging additional 1.5 V batts. Add one for each battery to be charged.
No. 42,467 $13.95

Type 2 Kit. Similar to A but delivers 12 mA @ 1.5 V with diode in circuit. Incl. cell array; solder coated leads; separate diode. **No. 42,464 $7.95**

Like 2, But Without Diode. Use when charging additional 1.5 V batts. w/Type B. **No. 42,465 $6.95**

New 3 V Microgenerator (not shown). High voltage, low current unit. 3 mA @ 3 V. No diode.
No. 42,710 $4.50

Low Friction Motor.

Rugged, yet operates on as low as 210 mA. Perfect for solar cell **No. 42,269**, at right. Use in toys & experiments. 1 1/16" dia., 1¼" L., 0.078" dia. x 3/16" long shaft. Color-coded leads. **No. 30,807 $2.95**

Solar Minipanels.

Great for recharging small rechargeable batteries! Equipped with dual two-wire leads, each terminated in a snap-on connector, and in-line diode to prevent discharge from Minipanels during darkness, they can operate a radio and charge a battery simultaneously. Optical coupling between light rays and the solar cells is magnified by the lenses that are molded into the top of the impact-resistant acrylic case. Obtain maximum output from this compact unit measuring only 2⅜" x 4" x ¼" & weighing less than 2 oz. 3 models available shown below. 9 V model delivers 18 mA current for only $29.95!

6 Volt, 36 mA current	**No. 42,745**	**$39.95**
9 Volt, 18 mA	**No. 42,746**	**29.95**
12 Volt, 18 mA	**No. 42,747**	**44.95**

New, Higher Power Silicon Solar Panels at Low Prices

Featuring the newest, most powerful & most advanced silicon solar panels available! Developed under the direction of photovoltaic expert, Dr. Joseph Lindmayer of Solarex Corp., they represent the best dollar/watt value today. They include: fine line redundant contact pattern for high fill factor & blue response; palladium passivated, titanium-silver front & back contacts for corrosion resistance, tantalum oxide anti-reflection coating for high efficiency & additional contact passivation & special formulated silicon rubber encapsulation for long-term ultraviolet stability. Each consists of varying arrangements of silicon solar cells in series w/blocking diode. Power is directly related to the percentage of full sun available. Sealed from weather exposure, equipped with polarized leads. All panels conservatively rated at: 100 mW/cm light at 25°C.

High Power Solar Cells

Our silicon solar cells get better . . . and believe it or not, so do our prices! These highly efficient silicon semi-conductor devices convert sun or incandescent light directly to electricity. Each cell is tested at 2,800° K color temp., at intensities equivalent to sunlight at 25° C±3°C. Each works from −65 to 125°C & has a transparent protective coating. All operate without a plastic lens (formerly needed to increase efficiency) for just about any solar energy application. Cells conservatively rated at 100mW/cm² light intensity at 0.45V 25°C. All are silicon n/p type with tab leads.

Photo	Number	Cell Size	Cell mA	Cell volts	Price
B	42,314	4"	2000	0.45	$34.95
B	42,270	3"	1200	0.45	19.95
B	42,269	2¼"	550	0.45	11.95
C	42,748	¾" x ¾"	80	0.40	6.95
C	42,268	¼ of 2¼"	125	0.45	4.95
D	30,735	0.4 x 0.8"	36	0.45	3.95
E	30,748	0.8" sq.	90	0.45	6.95
F	30,817	0.4 x 0.4"	22	0.45	2.95
G	42,647	½ of 2¼"	260	0.45	6.50
H	42,514	2" x 2"	800	0.45	39.95

Surplus 2¼" Round Cell. (like **42,314**) Produces 400 mA @ 0.42 V. No tabs or wires! **No. 42,728 $5.95**

Comments

(B) New! 4" Solar Giant. Largest, most powerful sing solar cell now available! Capable of delivering 1 full W Current is over 2 amps at 0.45 V. **No. 42,31**

(B) 3" Solar Cell. Delivers in excess of ½ W. Current 1.2 amps @ 0.45 V. New Low Price! **No. 42,27**

(B) 2¼" Solar Cell. Delivers 0.28W., 550mA at 0.45V D Perfect for solar experiments. **No. 42,26**

(C) New Encapsulated ¾" x ¾" Solar Cell. Delivers 8 mA at 0.40 V. **No. 42,74**

(C) Pie Wedge Solar Cell. ¼ of the 2¼" in A above. 12 mA @ 0.45 V. Ideal for student uses. **No. 42,26**

(D) High Powered Fun Cell. Delivers 36 mA @ 0.45 Perfect for science projects. **No. 30,73**

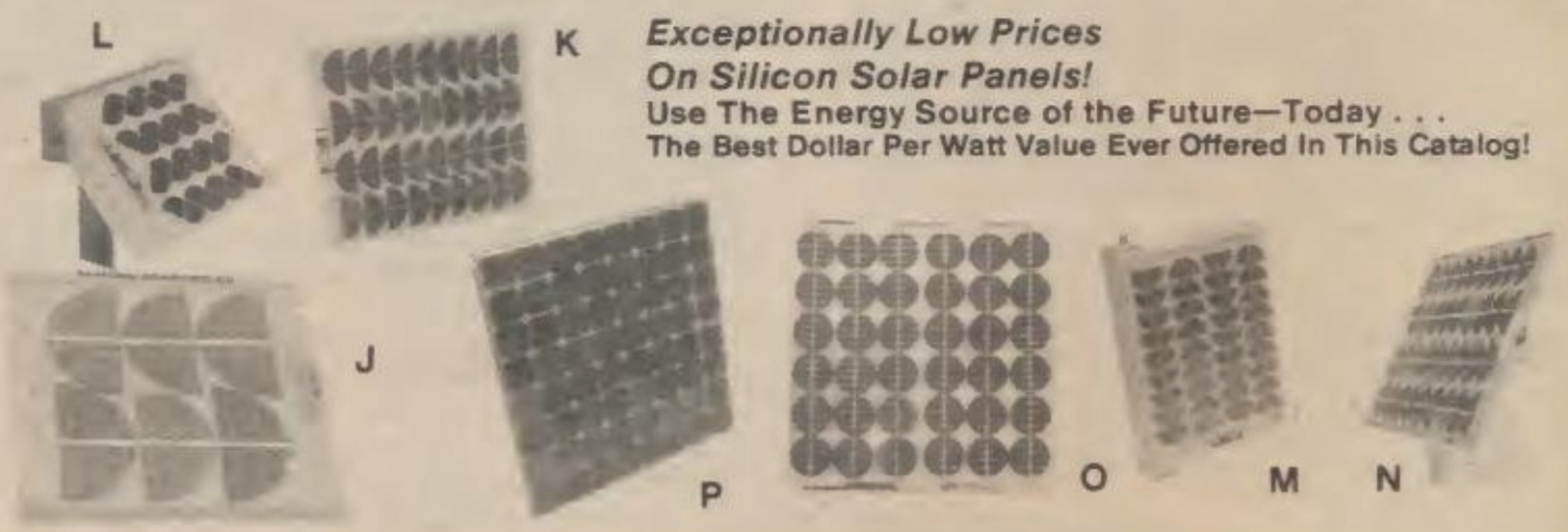
(E) 0.8" Square Cell. Delivers 90 mA @ 0.45 V. Great fo close-fitting arrangements. Surpasses quality of cel used in satellites but at popular prices. **No. 30,74**

(F) New 4 x 4" Rectangular Solar Cell. Delivers 22 mA 0.45 V. Great for light meters & other photometric a plications. Min. 10% efficiency. **No. 30,81**

(G) New! Half-Moon Solar Cell. Produces 260 mA 0.45 V. **No. 42,64**

(H) High Efficiency (15%) Solar Cell. For building pan where max. power/unit area is required. **No. 42,51**

(I) Photocell. ⅜" dia. Dark to light resistance— megs./45 K. 350 V AC max. **No. 30,829 $3.9**

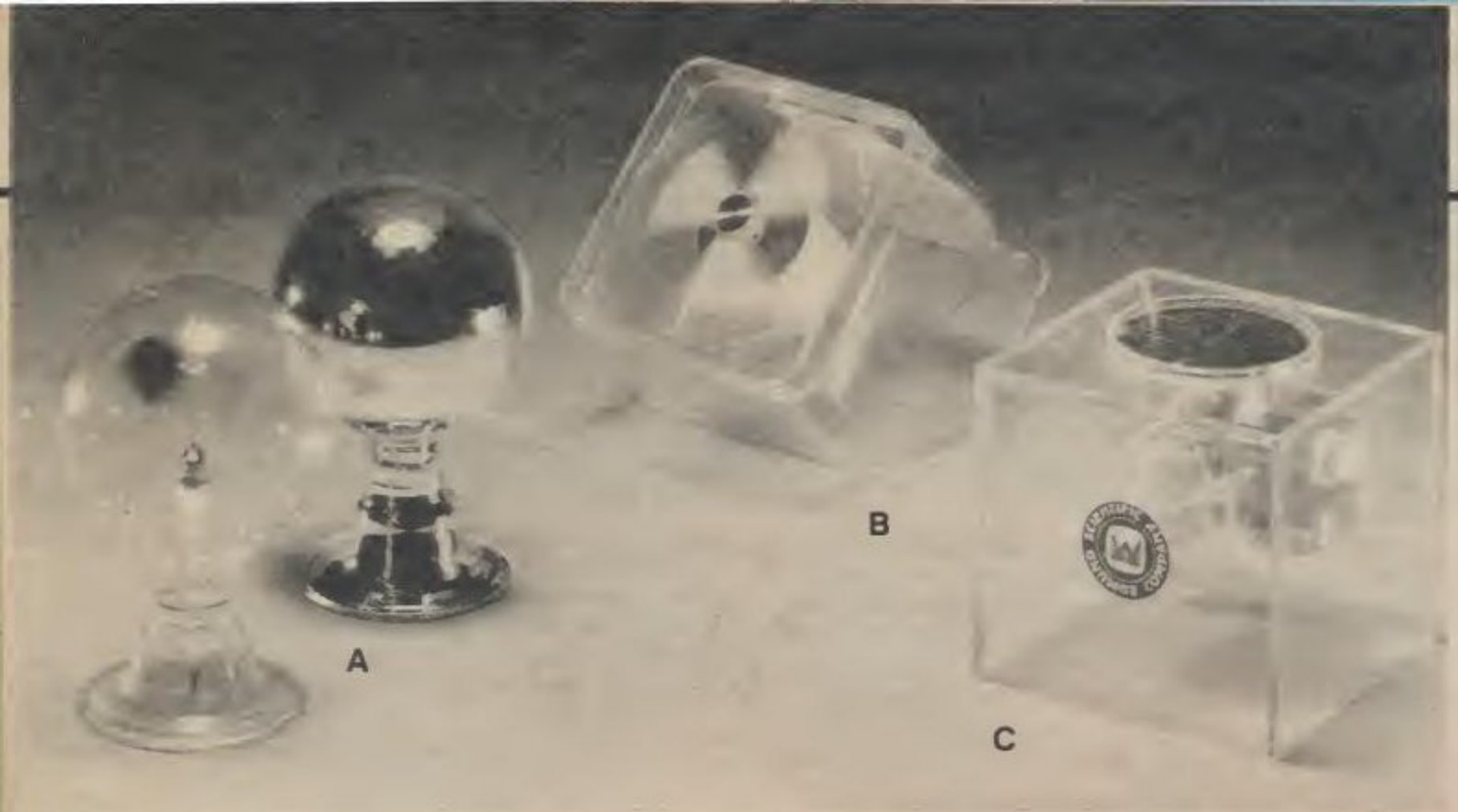


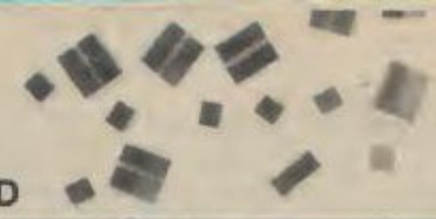
Exceptionally Low Prices On Silicon Solar Panels!

Use The Energy Source of the Future—Today . . .
The Best Dollar Per Watt Value Ever Offered In This Catalog!

Cell			Panel						
Photo	Size	No.	Volts	mA	Watts	Size	Amp. Hrs. Wks. 40 N. Lat.	Number	Price
J	2¼"	6	1.5	400	0.6	4½x5	12	42,312	$ 59.95
K	2¼"	16	6	400	2.5	5½x11	12	42,709	99.50
	2¼"	32	12	180	2.5	7x8½	5.4	72,281	99.95
L*	2¼"	32	12	180	2.5	7x8½	5.4	72,440	130.00
M	2¼"	36	14.7	400	6.0	10x11	12	72,355	229.95
N*	2¼"	36	14.7	400	6.0	10x12	12	72,070	269.95
M	3"	36	14	650	10.0	13x15¾	19.5	72,356	349.95
O	3"	36	14	1500	22	23x21	45	80,270	699.00
O*	4"	36	14	2150	36	27x27	64.5	85,264	1195.00
P**	2⅓"	64	12/24	2700/1350	35	21x21	81/40	85,302	1195.00

*These panels include frame, glass cover and junction box.
**This is a Dual Voltage Panel which includes frame, mounting hardware and junction box.





Low Current Solar Cell Motor.
Use with 25 mA cell or greater (at left). Has spring bronze brushes, self-aligning bearings. 0.35–1.5 V DC. $1\frac{3}{32}$" L x $1\frac{1}{4}$" dia. with 0.078" dia. x $\frac{7}{16}$" long shaft. Metal & plastic. **No. 40,872 $4.95**

Crescent Solar Cells.
Great for hobbyists & experimenters. These silicon solar cell chips are crescent shaped in various sizes. Somewhat larger than watch chips at left. Mix & match. Pkg. of 25. **No. P-42,749 $9.95**

Solar Conversion Unit
Shows how the sun's radiant energy can be converted to electricity to run a small motor. Relatively high conversion efficiency. Even works under strong incandescent illumination. Includes: high-output silicon solar cell, 0.35 1.5 V DC motor, spiral cardboard disc, grommet & instructions (no motor support or cell mount).
No. 60,505 $11.95

Build A Methane Generator And Recycle Organic Wastes
Build your own homesite power unit that uses free organic waste materials as fuel. Ideal for rural & suburban dwellers. 50 pp. book includes plans, drawings & charts that tell everything you need to know about designing & building a methane generator suitable for your home, or business. Gives details on producing methane gas for cooking, internal combustion engines & more. Paperbound. **No. 9485 $5.95**

"Your Home's Solar Potential"
Written by Malcom Wells and Irwin Spetgang, noted solar heating and architectural consultants. Is your House Solar-Suitable? Find out . . . Successful conversion to solar heat depends on many factors. This book takes some of the guesswork out of evaluating your home. Features solar principles, illustrated guide sheets, examples, installation tips, maps and graphs. The fuel economy tips you'll learn can save you money! 60 pages. **No. 9515 $9.95**

"SOLARIA . . . on the threshold of environmental renaissance"
The story of how, why & what went into building the first solar-heated, earth-covered house in New Jersey—joint project of Edmund, Malcolm Wells, solar scientist Harry Thomason & owner Bob Homan. Its system cut conventional heating costs as much as ⅔ in test homes over 10 yrs. Incl. 10 pps. of basic, practical plans. 67 easy-to-read, illustrated pages filled with suggestions. **No. 9469 $14.88**

"Solarex Guide to Solar Electricity." For anyone interested in solar cells as a source of energy. Background for beginners as well as practical applications & projects for experimenters. **No. 9580 $5.95**

"Stirling Cycle Engines." Excellent companion to our Stirling Cycle Models on page 35. Explains how they work, applications, history & more. **No. 9579 $5.50**

(A) Radiometers—Spin 3,000 rpm
Spins continuously at 3,000 rpm from heat of sun or light bulb . . . set it by your window and watch! Even operates under invisible infrared radiation such as that emitted by a candle. Requires no fuel, no lubrication, no repairs. Everyone loves to watch it and learn about this power source so vital and promising to man's future—solar energy. *This is a first-surface silvered model.* Silvering on one half makes it an interesting conversation piece for home or office. Gives you a hemispherical mirror. Turn radiometer until mirror faces you—at a glance you see a panoramic view of everything going on around and behind you. Attractive desk piece 5" high x 3" dia. Partial vacuum in glass globe where 4 vanes spin on a low-friction, needle-point bearing **No. 60,529 $6.95**
As above, but unsilvered. No. 60,082 5.95

(B) The Solar Energy Cube . . . A Demonstrator Converts Light into Electric & Kinetic Energy.
Great desk-top curio, this instructive, smartly styled solar energy demonstrator is equipped with 3 highly efficient silicon solar cells, clear plastic cube, a motor & propeller. Place it in sunlight or under an incandescent lamp, and watch it convert solar energy to kinetic motion. Uses same high-power cells found in our large solar panels. Great for teachers, experimenters & hobbyists. Produces 1.5 V DC, 225 mA of current in running motor. Speed of propeller is directly related to amount of light available.
No. 42,711 $24.95
OR BUILD YOUR OWN—in only 10 to 20 minutes. Complete kit includes all parts and instructions.
No. 42,813 $19.95

(C) Solar Music Box
Delightful & educational, the Solar Music Box chimes the beautiful tune "Edelweiss" when its cluster of solar cells is pointed at the sun or placed under a 60 W lightbulb. No winding; no batteries; it converts light into energy that powers the music box mechanism. A 5" clear acrylic cube encases the cluster, the high efficiency motor, drive wheel & the sound producing mechanism. You see inside! No assembly required. **No. 42,734 $31.95**

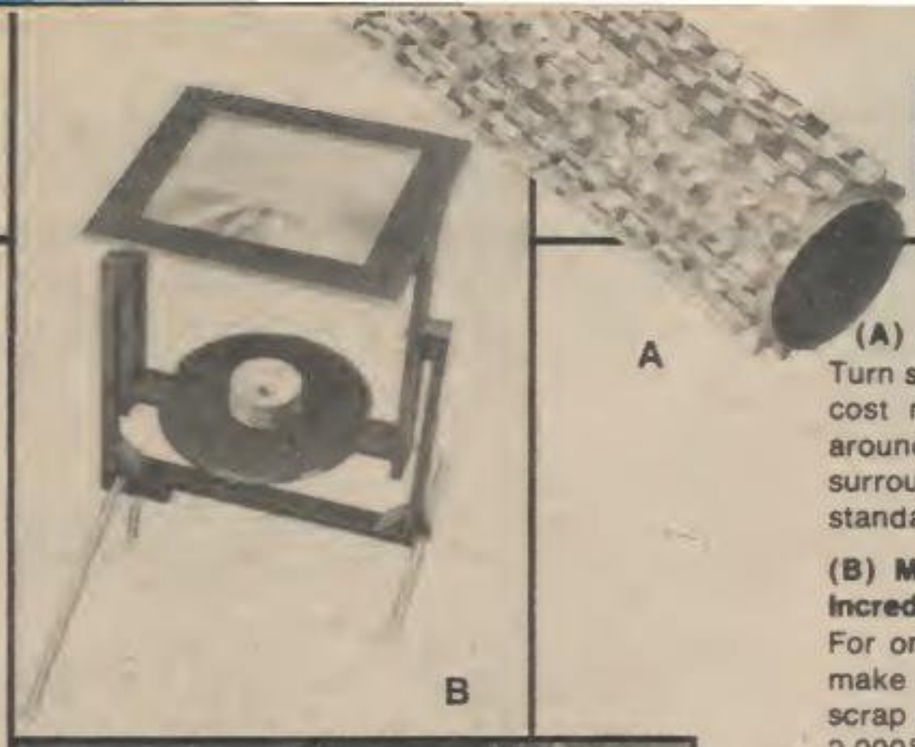
(D) Solar Cell Chips For Experimenters
Silicon solar cell chips are great for solarizing gadgets. Originally intended for solar watches & other devices. They vary in size & shape from 3 x 2 mm to 5 x 4 mm. Smallest produces 1 to 2 mA; largest 4 to 6 mA. Each produces 0.55 V open circuit & 0.45 V under load. Solder-connect in any configuration to fit your needs. Simply mix & match.
Pkg. of 50 Assorted Chips **No. P-30,828 $9.95**
Two or more Pkgs @ $8.95 per pkg.

(E) Solar Cell Kit.
Discover possible ways to help overcome the energy crisis with "free" energy from the sun. Highly technical book included. Silicon solar cells, hook-up wires, motor & a 96 pp. book "The Solarex Guide to Solar Electricity".
No. 72,127 $23.95

(F) Deluxe Solar Cell Kit.
Created by the co-inventor of the famous Bell System solar battery. Contains all the materials needed to turn silicon slabs into working solar cells. Accompanying text explains principles & theory of solar energy & its application to solid state physics. In addition to making your own solar cells, there are also projects for using them. You get chemicals, wire, solder, forceps planting bottle, tape, steel cups, silicon wafer, Edison base coil & 94 pp. book.
No. 71,906 $36.50

(G) Complete Photovoltaic Demonstration Kit.
Complete solar kit demonstrates the direct conversion of sunlight into electricity. Kit has 19 modular component parts which can be connected to provide many different series and parallel circuits. Components: 4 silicon solar cells, 1 electric motor & one buzzer module, 2 rheostat modules (0.5–5 ohms & 10–100 ohms): 9 leads (fr. 1 cm-500 cm), 1 ammeter & one voltmeter module. Contact our Customer Service Dept. for more information.
No. 80,268 $299.95

Energy



(A) Inexpensive Flue Pipe Heat Exchanger
Turn smoke pipes from stove, furnace or boiler into low-cost radiator. Spring type aluminum fins simply slip around your flue pipe & divert normally lost heat into the surrounding room. Includes 16 fins that partially cover a standard 6" diameter pipe. **No. 72,149 $10.95**

(B) Make A 2,000°F Solar Furnace And Harness The Incredible Heat Of The Sun!
For only a few dollars you can build a simple, easy-to-make Solar Furnace using this Fresnel Lens and some scrap parts. Your furnace will develop temperatures of 2,000°F within the area of the focus spot. Use the sun for cooking, soldering & brazing, tempering small flat springs or firing enamel on jewelry! The lens is 11¾" square, $\frac{1}{16}$" thick, and has an 8½" focal length. Effective speed is about f/1.35. Lens only (you supply other parts) & Booklet No. 9053 (below) included. **No. 70,533 $6.95**

"Fun With Fresnel Lenses". Instructions for building a solar furnace, camp cooker, overhead projector & more. 16 pp. Paperbound. **No. 9053 $1.00**

Giant 7½" Burning Lens. Creates an intense hot spot to ignite paper, wood shavings. Excellent magnifier. Plastic. **No. 41,919 $5.50**

Detect Your Home's Heat Loss! Compact, solid-state unit detects small air currents & tracks them to their source. Simply scan walls, ceilings, windows or doors with wand. Meter indicates variations as little as 0.2°. Range: 35–95° F. Uses 9 V transistor battery. **No. 61,199 $39.95**

(C) Solar Oven Kit
Boil water, cook food or build a solar projector with the sun & this kit. Ideal for science projects. 6" high, comes with 6¾" parabolic reflector, support stand, test tube & tube holder. **No. 42,427 $4.95**

(D) Folding Solar Camp Cooker . . . Portable!
A powerful parabolic reflector complete with cooking extension arm & tripod. Boils a pot of water in 20 minutes under full sun. Folds to 20"x8"x2". Aluminum. Parabola approx. 36" dia. 2 lb. **No. 72,148 $29.95**

(E) The Sun Motor . . . Demonstrates Energy Conversion!
Incoming heat from sun, bunsen burner or propane torch is collected & concentrated by the 18" aluminum solar reflector. Hot cap of the stirling cycle engine receives energy & efficiently converts heat to mechanical motion. Easily attaches to conventional camera tripods w/socket head cap screw. All-metal. Engine: 8" long x 1¾" dia.; 3½" flywheels, ¾" bore. **No. 80,311 $99.95**

(F) Stirling Cycle Engine
Operates on heat from any source, including solar energy! Developed in the 19th century, the Stirling Cycle Engine utilizes a special thermal cycle for the operation of a generator, model toys & novelties. Speed can climb to 1,000 rpm. 7¼"x4", all metal construction. Comes with instructions & historic information in a lavishly illustrated book. **No. 61,245 $49.95**

(G) Practical Portable Solar Water Heater
Take this amazing heater anywhere you might need hot water . . . for bathing, dishwashing, laundry or just showing what solar energy can do! 12"x19" vinyl heater folds compactly for easy packing. Holds 10 qts. of water—enough for a refreshing hot shower. Just fill with water & place heater on flat surface w/clear side exposed to direct sunlight. On a 70° day, water temp. goes over 100° in 3 hours! Sensor spot shows approx. water temp. Funnel-shaped bottom to send water into 29" long hose. On/off valve. Instructions. **No. 72,176 $14.95**

(H) Always Have A Charge In Your Flashlight
Emergency solar flashlight recharges with sun power. Mount detachable solar cell array to car dashboard or windowsill to recharge. Includes NiCd batteries. 7¼" long, 12 oz. **No. 61,102 $34.95**
Solar Cigarette Lighter! See page 54.

(I) Solar Reflective Material For Experiments
Experiment with heat by reflectors. Make solar reflectors, giant "mirrors", solar cookers, photo light concentrator, sunbathing reflectors & more:
Self-Adhesive Solar Sheeting
Highly reflective "chrome" finish material applies to any surface for a mirror-like effect. Waterproof, 5 mm thick but very durable. Even fits around curves without tearing. 30'x6" roll. **No. 72,031 $32.95**
3 or more rolls @ $29.95 each. For larger quantities, contact our National Sales Dept.

(J) Solarvent™ Ventilating Fan . . . An Ideal Attic Fan!
Requires no hook-up to 110 V wiring nor any fuel. Operates whenever the sun shines. Moves up to 250 cu. ft. of air/minute at no charge to your electric bill. Weatherproof photovoltaic panel powers the system. Simple & safe to install on roof or ducts. Motor & panel ideally matched for peak efficiency. Yields enough power to generate fan in 15% full sun. 7½"x20"x¼". **No. 80,295 $299.95**
Motor Only. **No. 72,461 99.95**

(K) Miniature Solar Power Plant Kit With Solar Cell
Power toys & novelties with solar energy by using this kit. Complete instructions for toy cars, trucks & more. 7½"x4⅝"x1¼". Unassembled. **No. 42,741 $6.95**

(L) Solar Powered Propeller
Same as above, but already assembled. Just put it on a beanie! Can be dismantled & used to build other solar powered toys. 6" diameter. **No. 42,742 $11.95**

(M) Solar Energy Inventor's Kit
Use your imagination with the kit's solar cell, electric motor, propeller & gears. Convert small toys. Other ideas & instructions included. **No. 42,743 $10.95**

(N) Portable Solar Cooker . . . Use Sun, Not Fuel
Cooks food in 10–15 minutes under full sun. 13"x13"x4" expanded polystyrene cooker weighs under 1 lb. Recipes & instructions show how to use included sun-tracking device, skewer & lock, reflector, adjustable stand, & twenty 7"x12" solar foil sheets. **No. 71,653 $19.95**
20 extra sheets of Solar Foil. **No. 42,607 2.50**

(O) Science Finds New Way To Cook Meat
Cuts time & fuel use by 35–50%! Also reduces meat shrinkage. Insert diagonally through your roast or ham & meat cooks inside out. No basting necessary, dishwasher safe. **No. 60,987 $15.95**

(P) 18 Inch Diameter Parabolic Reflector
Originally designed to collect & focus the sun's rays for a solar engine. Precision-made of highly polished aluminum with a focal point approx. 4.5" above the 1⅛" center hole. Ideal for use in building solar energy collectors, solar furnaces, reflecting floodlights and parabolic microphones. **No. 80,254 $17.95**

Big Concave Mirror
Second surface glass mirror makes a solar furnace, solar reflector & more! 16" dia., ⅛" thick, $\frac{15}{16}$" deep, 22" f.l. Aluminized back. 6 lb. **No. 80,097 $20.95**

Energy Saving, Heat Reflecting Sheet
Reflects body heat so you can turn down the thermostat & forget electric blankets! Perfect for home & camping—won't soil or wear out. For twin or double beds.
No. 70,886 $12.95

MASTER CHARGE, VISA & AMERICAN EXPRESS credit cards gladly accepted. See page 50C for our 24-hour direct order telephone line.

cialized Quality Glassware—
Heat-Resistant Kimax® Glass

Tubes: Sturdy lips; marking spots; uniform tubing.

).	x	Length	Capacity	Qty	Number	Price
)	x	75 mm	4 ml	72	P-60,889	$12.95
?	x	75 mm	6 ml	6	P-41,847	2.95
)	x	100 mm	10 ml	72	P-71,494	13.95
)	x	100 mm	10 ml	6	P-41,848	2.95
)	x	150 mm	24 ml	72	P-71,495	17.95
)	x	150 mm	24 ml	6	P-41,849	4.95
)	x	150 mm	28 ml	72	P-71,496	19.95
)	x	150 mm	36 ml	72	P-71,497	22.95

duated Cylinders: Removable plastic bases; safeguard pers; sturdy borosilicate glass (not heat-resistant).

Graduated	Height	Qty.	Number	Price
) ml in 0.2 ml	132 mm	6	P-71,487	$15.95
) ml in 0.2 ml	132 mm	1	P-41,850	3.95
) ml in 1 ml	185 mm	1	P-41,851	5.95
) ml in 1 ml	248 mm	6	P-71,488	26.95
) ml in 1 ml	248 mm	1	P-41,852	6.95

ng Flasks: Flat bottoms, reinforced rolled tops. Comply Fed. Specs. NNN-F-240. Kimax® Glass.

apacity	Height	Qty.	Number	Price
50 ml	92 mm	12	P-71,489	$28.95
250 ml	143 mm	12	P-71,490	31.95
500 ml	182 mm	6	P-71,491	22.95
500 ml	182 mm	1	P-41,853	5.95

kers: Flared, beaded top; spouts; marking spot; comply Fed. Specs. NNN-B-175. Kimax® Glass.

Graduated	O.D.xHeight	Qty.	Number	Price
0 ml in 10 ml	50 x 71	12	P-71,483	$16.95
0 ml in 25 ml	68 x 88	12	P-71,484	15.95
0 ml in 25 ml	68 x 88	1	P-41,854	3.95
0 ml in 25 ml	77 x 106	12	P-71,485	19.95
0 ml in 25 ml	77 x 106	1	P-41,855	4.95
0 ml in 50 ml	107 x 145	6	P-71,486	22.95
0 ml in 50 ml	107 x 145	1	P-41,856	6.95

nmeyer Flasks: Narrow mouth; heavy-duty tops; marking uts; comply with Fed. Specs. NNN-F-240. Kimax® Glass.

Graduated	Dia.xHeight	Qty.	Number	Price
0 ml in 10 ml	50x 78 mm	12	P-60,886	$18.95
5 ml in 25 ml	66x108 mm	12	P-71,492	19.95
5 ml in 25 ml	66x108 mm	1	P-41,857	3.95
0 ml in 50 ml	102x174 mm	6	P-71,493	13.95
0 ml in 50 ml	102x174 mm	1	P-41,858	4.95

Safe Matchless Sparkshooter

al for lighting bunsen burners, propane torches, acetylene hes & gas not plates. Needs no batteries, flint or fuel. h of the button generates 4 separate 20,000 V sparks. sture will not affect its performance. 1"x3"x12½".
No. 61,081 $11.95

Dry Ice Maker For Lab Or Shop

aches to standard syphon-type CO_2 cylinders. Simple to . Ideal for quick-freezing samples & for cold storage of cimens. Includes adapter nozzle, cone, 1 lb. collection , clamp, washer & instructions. Great for labs & fishing ts! **No. 71,533 $54.95**
ra Collection Bag. No. 41,626 5.25

(D) Portable Bunsen Burner

• Self-Contained For Field Use • Reusable Burner & Valve
Unit burns for over 7 hours on 1 fuel container. Finger control for soft flame or hot blast. Uses specially blended butane fuel. Disposable containers. Ideal for field & classroom!
No. 71,556 $15.95
Replacement Fuel (7 hrs.) **No. 41,672 3.95**
Flame Spreader (wing top) **No. 41,673 3.95**

(E) Predict & Demonstrate Over 30,000 Chemical Reactions

Chemical Predictor has 2 charts of equations arranged so any combination can be instantly selected to furnish the detailed equation for the chemical reaction. Numerical data shows if a reaction can occur, its extent & its products. Plastic-coated. 5½"x11". **No. 40,752 $2.95**

(F) Giant Atomic Wall Chart At Mini Price

An impressive addition to any lab or classroom, this varnished, soil-resistant 32"x45" full-color chart is a modern reference for chemical & nuclear subjects. Explains & diagrams radioactive isotopes, solar energy, H-bomb reactions & fission. Gives symbols, names, atomic weights & electrons in each orbit or 103 elements. Graphs, diagrams & definitions on chart. **No. 82,061 $5.50**

Top Quality Glassware . . . Now you can buy glassware in the quantities you want. We don't restrict your purchase to case lots! It pays to shop at Edmund Scientific.

(G) 27 Piece Chemistry Glassware Set

This top quality labware, made of heat-resistant Kimax® glass, is perfect for job, home or school experiments. Easy-to-read calibrations, easy pour spouts, smooth but durable lips. Economical set includes: (5) each of 13x100 mm, 16x150 mm, 18x150 mm test tubes; 400 ml & 250 ml graduated beakers; 50 ml graduated cylinder w/plastic base; 60 ml poly dropper bottle; (2) 1 ml graduated pipets; 50 ml & 125 ml Erlenmeyer flasks; 250 ml boiling flask; 3 stirring rods.
No. 71,482 $34.95

Surplus

Lab Thermometers. Partial immersion; white background; mercury in glass. *Nitrogen-filled **Each $3.00**

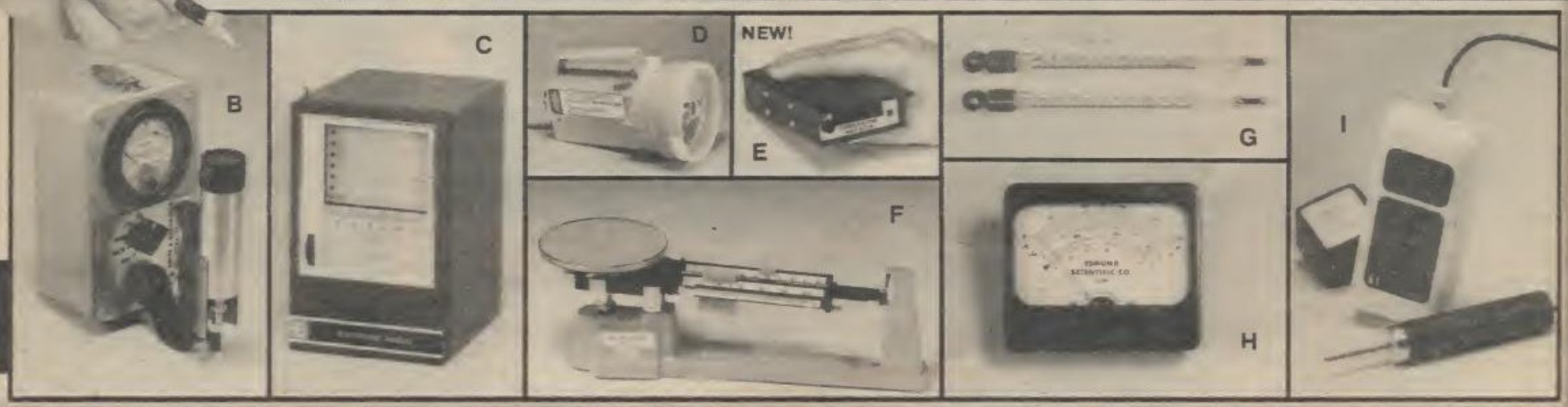
Number	Range	Graduated	Length
71,776	30–100°C	Every 1°	300 mm
71,777*	65–85°C	Every 1°	300 mm

Mini Vials. Flint glass test tubes 11.25 mm dia. x 55 mm long. Ideal for specimens, field samples, spices on picnics. Includes tight-fitting plastic press-on caps. Pkg. of 144 vials w/caps. **No. P-72,295 $9.95**
2 Oz. Spray Bottles. Plastic spray pump bottles with fine atomizing nozzle. Pkg. of 6. **No. P-61,190 $3.25**

Improved Stainless Steel High-Speed Water Distiller

Produces 4.8 gallons of distilled water per day. Great for photo-processing & scientific labs. Water vaporizes in boiler, condenses in aluminum finned cover, flows into ½ gal. receiving bottle, shuts off automatically when full. Red light signals complete distillation. 9½" sq. x 17¼" high. 9 lbs. Includes 4 receiving bottles & instructions.
No. 80,315 $220.00
Standard Distiller. ½ gal. capacity, produces 2 gals./day. 9½"x13". 6 lbs. 2 receiving bottles.
No. 80,102 $99.50

Lab Equipment



(A) Glue Shooter: This applicator nozzle allows you to place adhesives, sealants & lubricants w/ syringe-like accuracy. Designed to work with most collapsible tubes & plastic bottle spouts. Ideal as disposable applicator tip for one-drop cyanoacrylates.

Includes 25 replacement tubes. No. 42,825 $9.95
Pkg. of 100 replacement tubes. No. 42,826 8.50

(B) Professional Geiger Counter. Shock proof. Simple to operate; ideal for lab use! Ranges 0–20, 0–2, 0–.2 mR/hr. Lightwt. (3.5 lb.); detects Alpha, Beta & Gamma radiation. Regulated high & low voltage for stable, dependable readings. Accuracy: ±2% of full scale on all ranges. 4 "D" batts. incl. for over 200 hrs. operation. 4-position range selector switch & push button batt. test switch. 4⅞" x 8¼" x 6½" high. Drop Ship.

No. 19,187 $399.50

(C) Low-Cost, Inkless Strip-Chart Recorder
Monitors Solar, Wind, Electrical & Temperature Experiments. 0–1 mA Range, ±2% Accuracy. Shock & vibration resistant taut-band, friction-free element; special writing element works on pressure sensitive chart paper. 1800 dots/inch w/gear train supplied (chart speed variable with gear trains below). 1"/hr. chart speed; flush-mounting hardware; 115 V, 60 Hz. 3⅝"x5⅝"x5⅜". 3½ lbs. Access window permits notation while recording. Re-roll or tear-off operation; alum. case **No. 1676 $169.95**

6 Replacement Charts. 10 major divisions, 50 minor divisions. 63 ft. x 2⅝" wide, 2⅛" active width.

No. P-61,104 $26.95

Extra ⅛"/hr. Gear Train. 14,000 dots/inch.

No. 42,418 $13.95

Extra 12"/hr. Gear Train. 150 dots/inch.

No. 42,417 $13.95

(D) 2-in-1 Stroboscope/Tachometer. Stroboscope stops or slows apparent motion of object; tachometer measures speed of rotating object. Check printing register, motor speed, etc. Incl.: Xenon flash tube, calibrated rpm dial, 200–6000 flashes/min. 7" long; high impact plastic. 4" dia. reflector & tripod socket. 115 V, 50/60 Hz. Wt. 27 oz. **No. 71,500 $179.95**

(E) Hand Held Digital Thermometer: Low cost, highly accurate—for laboratory use. Many applications in food processing, heating & cooling systems, scientific labs. Features: Micro-Processor Control; solid-state MOS components; ³⁄₁₀" digital read out display in °F & °C; rechargeable NiCd energy cell, AC adapter-recharger included; attached probe holder; probe; accuracy: better than ±0.1°. Range: 0–110°C or 32–230°F. Aluminum case. **No. 42,822 $169.95**

Additional Probes: Air probe No. 42,823 24.95
Surface Probe No. 42,824 19.95

(F) Metric Triple Beam Balance. Sensitive, sturdy & parallax free! For industry, research & school. Easy operation, magnetically damped; not sensitive to out-of-level conditions. Easy-reading tiered beams: 0–500 g, 0–100 g; 0–10 g. Sensitivity: 0.1 g. Capacity: 610 g. Size: 6x6x18"; stainless steel platform.

No. 71,695 $79.95

Accessory Weight Set. Expands capacity to 2610 g. Incl. one 500 g & two 1000 g wts. **No. 41,766 $19.95**

(G) Accurate Pocket Thermometers. For general lab work. Lightweight, easy to read, calibrated for total immersion. 5½" long. Protective case w/ pocket clip. **Fahrenheit** 0–220° (2° divisions). **No. 60,991 $6.95**
Celsius –15–105° (1° divisions) **No. 60,992 7.95**

(H) Precision Pyrometer. Calibrated for Type K (Chromel Alumel) thermocouples. Also used as a millivoltmeter. Jewel bearings; non-magnetic pivots; zero adj. screw; 3 scales: 32–2500°F; 0–1370°C; 0–55 m V DC. 4.5"x4". Can be mounted. Includes conversion charts and instructions. **No. 70,408 $54.95**

Thermocouple. For 0–2400°F. 17" L. 14 AWG Chromel, Alumel wire. Six 1" insulators protect hot end. Color coded leads. **No. 40,478 $ 7.95**
As above but w/30" leads No. 42,193 11.95

(I) Portable Industrial Thermometer
Solid-state, hand-held; measures temperatures of gas, liquids & solids. Range: 0–999°F. Wt. 13 oz. Large ½" LED display assures precise readings. Peak hold circuit allows you to concentrate on placing probe in delicate areas by maintaining the highest temp. reading after removal of probe. Incl. recharger unit, holster case, wrist strap & general purpose probe. Ideal for temperature measurement of engine & motor surfaces.

No. 16,006 $249.00

Accessory Probes: Surface No. 30,822 40.00
Air/gas No. 30,823 40.00
Spot Test No. 30,824 15.00
Penetration No. 30,825 25.00
Circuit Test No. 30,826 25.00

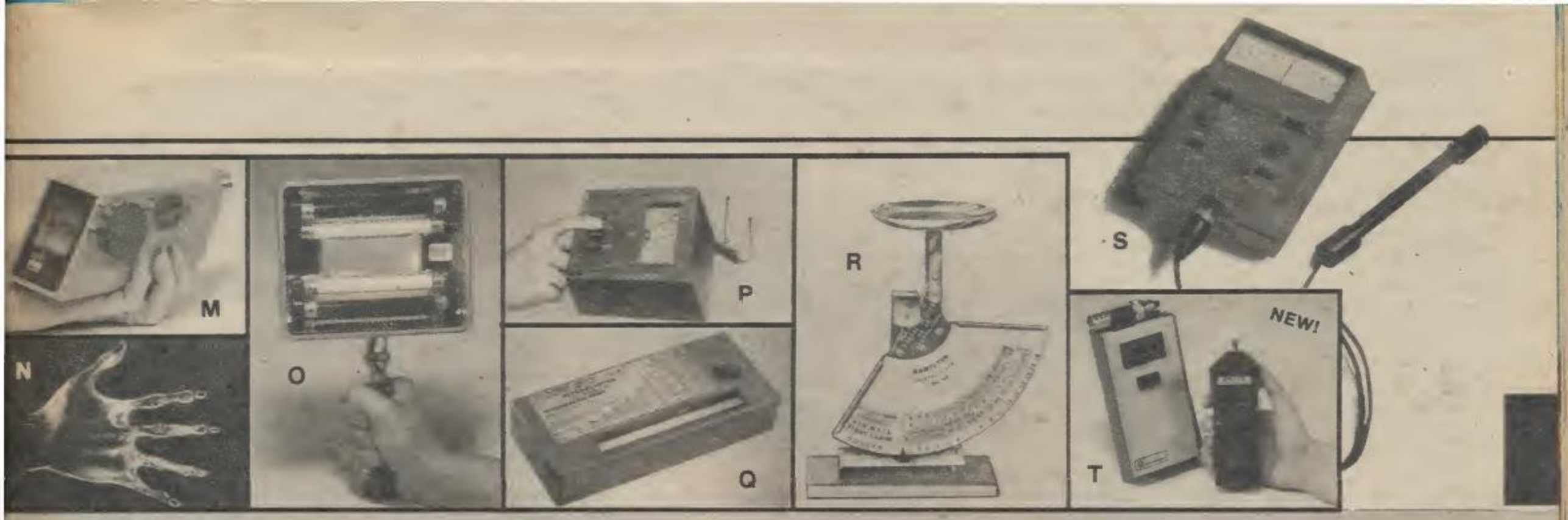
(J) Ohaus Dial-O-Gram 1600 Single Pan Balance
• 2610 gram capacity • 10 gram dial
Every measurement is easier, faster! 3 weights are easily attached; store in contoured base. For industry, research & school. Includes patented Ohaus tare poise—internally threaded with a flat spring that allows you to slide it along the beam for rough taring & rotate for fine adjustment. Accurate even when not leveled. Stainless steel platform. **No. 72,466 $116.00**

(K) Ohaus Low-Cost Double Pan Balance
Die-cast base; reinforced aluminum beam; steel knife edges; self-aligning steel bearings. 2 wt. sets: Avoire—(two) 1/16, ⅛, ½, 1 & 2 oz.; Metric—(two) 2, 5, 10, 20 & 50 g. All wts. marked. 2000 g capacity; 0.5 g sensitivity.

No. 71,168 $49.95

(L) Ohaus Dial-O-Gram Single Pan Metric Balance 10 mg. sensitivity. Fast, accurate to 0.052 g. Precision spring direct reading vernier dial. Specific gravity capability platform stores in base. 310 g capacity. 10 g x 0.1 g dial calibration. Vernier 0.01 g values.

No. 71,970 $129.95



pring Balances. Surplus 650 g capacity clear lucite pring balance. Dual scales read up & down. Adj. ointer. Pkg. of 3. **No. P-42,673 $4.75**

M) Deluxe Sound Level Meter . . . Only $79.95
ow-cost, precision instrument checks noise levels in 5 anges (70, 80, 90,100,110 db). Palm-size, it features: cale readings from −10 to +6 db. in ea. range; 4-pos. unction knob & built-in phono jack for meter use as eparate mike. Ideal for hi-fi speaker positioning; many ses in high noise areas. 7½ x 2¾ x 2". Wt. 1 lb. Batt. perated. **No. 72,187 $79.95**
req. Res. Test Record (19 tones)
No. 72,188 $6.95

N) Liquid Crystals To Measure Temperature in Color. or research labs & industries where there is a need to bserve chemical reactions to temperature. As temp ses, bluer colors result; as temp cools, redder colors ppear. 12x12" sheets are available in the following emperature ranges: **$7.95 ea.**
lo. 72,375: 20–25°C. No. 72,372: 35–36°C.
lo. 72,374: 25–30°C. No. 72,371: 35–40°C.
lo. 72,373: 30–35°C. No. 72,370: 40–45°C.
x6" kit incl. 6 sheets temp ranges above.
No. 42,605 $8.95
x12" kit incl. 6 sheets temp ranges above.
No. 61,161 $19.95

O) Multi-Purpose Ultra Violet Lamps.
land-Held Lamp. Portable! Has 2 hi-output black lite ubes, 2 daylight tubes, centered optical magnifier, dual witches, swivel handle, reflector & rugged housing. ses 115 V AC, 60 Hz, 2537 Å. For printing labs, security nvestigators & UV experimenters.
No. 72,397 $119.50
Bench Lamp: Above w/ pedestal stand.
No. 72,398 $135.00

P) Electronic Thermometer
Three inputs measure temperatures at 3 separate locations (up to 1000' from instrument). 4 position push-button select: dual temp scales (−22 to +22°F & −30 to +40°C). Accuracy ±1. 3 solid-state waterproof probes ea. w/15' cables. Uses one "D" batt. (not incl.) Walnut cabinet. **No. 71,741 $87.00**
Extra 15 ft. probe No. 41,839 9.95
50' ext. cord with connectors. No. 41,838 9.95

(Q) Psychro-Dyne Psychrometer—Motorized. Batts. incl. High quality instrument for precise measurement of moisture in the air. Built according to U.S. Gov't specs. Based on the principle of observing difference between wet & dry bulb thermometers, it expresses this quantity as relative humidity, absolute humidity, dew point or vapor pressure. Incl. instr., carrying case & proper humidity scale. **No. 72,322 $95.00**

(R) Economy Gram/Oz. Platform Scale. 16 Oz. Capacity. Weigh food; mail & small packages. Counter-weight-type balance made of polished steel & alum. has 4" dia. tray. 6" high. Calibrated 0–16 oz. (0.5 oz subdivisions); & 0–500 g (10 g subdivisions).
No. 90,053 $14.95

(S) Portable pH Meter. Ideal for field use. Compact 3x4x2" high-impact case; 2–12 pH range in 0.1 pH increments; accuracy ±0.15 pH. 0.2 pH over full scale. Has "no-fill" combination electrode, temp compensation adj.; batt. check; easy-read dial; BNC connector w/Teflon insulator. 2 standardized buffer solutions; distilled H_2O reference solution; 9 V carbon-zinc batt. & instr. **No. 71,878 $149.95**
Replacement Electrode No. 42,026 54.95

(T) Digital Photo Tachometer: Measures rpm instantly from ¼–30" away. Exclusive "never forget" memory holds reading indefinitely. Target eye tells you when contact is made. Five ⅜" high LED readouts; quartz crystal controlled accuracy ±1 digit up to 0.03%; direct reading to 30,000 rpm. 100% solid state & batt. powered. **No. 16,012 $297.95**

Digital Contact Tachometer: Continuous rpm update every sec. Only 5 digit model avail. that reads from 0–20,000 rpm. Battery powered; measures rpm of motors, centrifuges, fans—anything that rotates. Quartz Crystal accuracy ±1 rpm. **No. 16,013 $174.95**

(U) Low-Cost Double Pan Beam Balance—For Home, School & Lab Use. Easy-to-read & use! Has double graduated beam w/sliding weight for avoirdupois or metric. 3¾" dia. removable steel pans are acid dipped & zinc coated. Capacity: 1790.625 gr.avoir. or 100.2 g metric. Calibrated 50x1 g, avoir.; 3.2x0.1 g metric. Incl. 6 metric wts. 6¾"x¾"x3⅝". **No. 72,298 $32.95**

(V) Autogram 1000 Balance: Direct read-out optics. For quality control & industrial labs. Truly portable; weights are external w/easy locking bar. No time consuming leveling required . . . insensitive to out-of-level conditions. Capacity 1,000 g; sensitivity: 0.1 g; optic read-out: 100 gx0.1 g. Features: Touch-N-Weigh automatic weight loading system—nine 100 g integral wts. & storage rack, illuminated screen & vernier, Tare Control knob & magnetic damping. 115 V, 50/60 Hz, grounded cord & plug. Stainless steel case.
No. 72,465 $625.00

(W) Portable Solid/Liquid Beam Balance For Laboratory And Field Work. Weigh small animals, plants, jewels & more. Self-contained balance weighs just 2 lbs. 6 oz. Capacity: 101 g; sensitivity: 0.01 g. Features deep-notched beam for positive micrometer poise settings 0.01–1 g; beam graduated 0.50x1 g; alum. pan w/handle & spout; magnetic damping springs; precision steel pivots for long life & max. sensitivity. 9⅞x3¼x1⅛". Protective cover. **No. 72,287 $79.95**

Disposable plastic cups for mixing & measuring. Ideal for the lab! See page 82

Lab Equipment

Edmund Ultrasonic Cleaners For Home & Industry

(A) Pint Capacity Ultrasonic Cleaner

***Built-in Tank *Pilot Light *Transistorized**

Excellent for cleaning delicate items from diamonds to precision parts. 6x4x4" metal cabinet with item platform. 115 V, 60 Hz., completely transistorized. Cleaning powder & instructions included. For home, shop or medical labs. **No. 71,003 $99.95**

(B) Ultrasonic Cleaner With 3 oz. Capacity

***Solid State Dependability *UL Listed *Low Price**

Clean small, delicate items with gentle, penetrating ultrasonic energy. 2¼ x 1½" stainless steel cup is ideal for jewelry, coins, brushes & pen tips. 115 V, 60 Hz., 12 W. 3¾" high. Tweezers, brush, 3 pkgs. cleaning powders, instructions included. **No. 41,373 $59.95**

(C) Large Capacity Industrial Ultrasonic Cleaner

***Cleans Many Items at Once *One Knob Control**

115 V, 60 Hz., 30 W. 1¼ qt. capacity (shown). Inside dimensions: 5⅜ x 5⅜ x 3"; outside: 5⅞ x 5⅞ x 7½". Stainless steel tank cover. Wt. 4½ lbs.

No. 71,198 $133.25

½ Gallon. Inside: 5⅜ x 5⅞ x 4". Outside: 8¾ x 6⅞ x 6⅜". 115 V, 60 Hz., 35 W. Weight: 8 lbs.

No. 85,126 $149.50

(D) Deluxe 1½ Gallon Capacity 140 Watt Cleaner

***Power-On Light *Largest Capacity Cleaner**

Our largest unit has all the best features: 140 watts of power, timer, drain cock, lid & complete instructions Inside dimensions: 11⅝ x 5⅞ x 6". Outside: 13½ x 7½ x 9¾". Wt. 16 lbs. 115 V, 60 Hz., 3 A.

No. 85,128 $359.95

Ultrasonic Chemicals

Acidic Cleaning Powder

Forms acidic cleaning solution for removal of calcium deposits, organic residues, stains, tars, oxides, tarnish & rust. Not for use on aluminum. 6 oz. container.

No. 30,804 $4.35

General Purpose Cleaning Powder

Forms non-ammoniated alkaline solution for removing oil, grease, waxes, polish, paint & more. Not for use on aluminum & magnetic alloys. 6 oz. **No. 30,805 $9.95**

Silver Cleaning Powder

Removes tarnish from silver. 6 oz.

No. 30,806 $10.95

(E) Low Cost, Hand-Held Vacuum Pump

***Produces a Vacuum up to 30 Inches of Mercury**

Made of high impact plastic, this pump has 2 ft. of ¼" clear plastic tubing that attaches to the vessel you wish to evacuate. 1⅝" diameter gauge registers 0 to 30" of mercury; 5" polyethylene lifter attaches to end of tube; 2½" diameter cup firmly grips flat, non-porous surface as the vacuum is created. A must for school science classes, the pump has many practical applications including bleeding fluid lines, starting siphons, vacuum packing, clearing stopped drains and more. Overall size: 7x4". Pump resists most acids & bases.

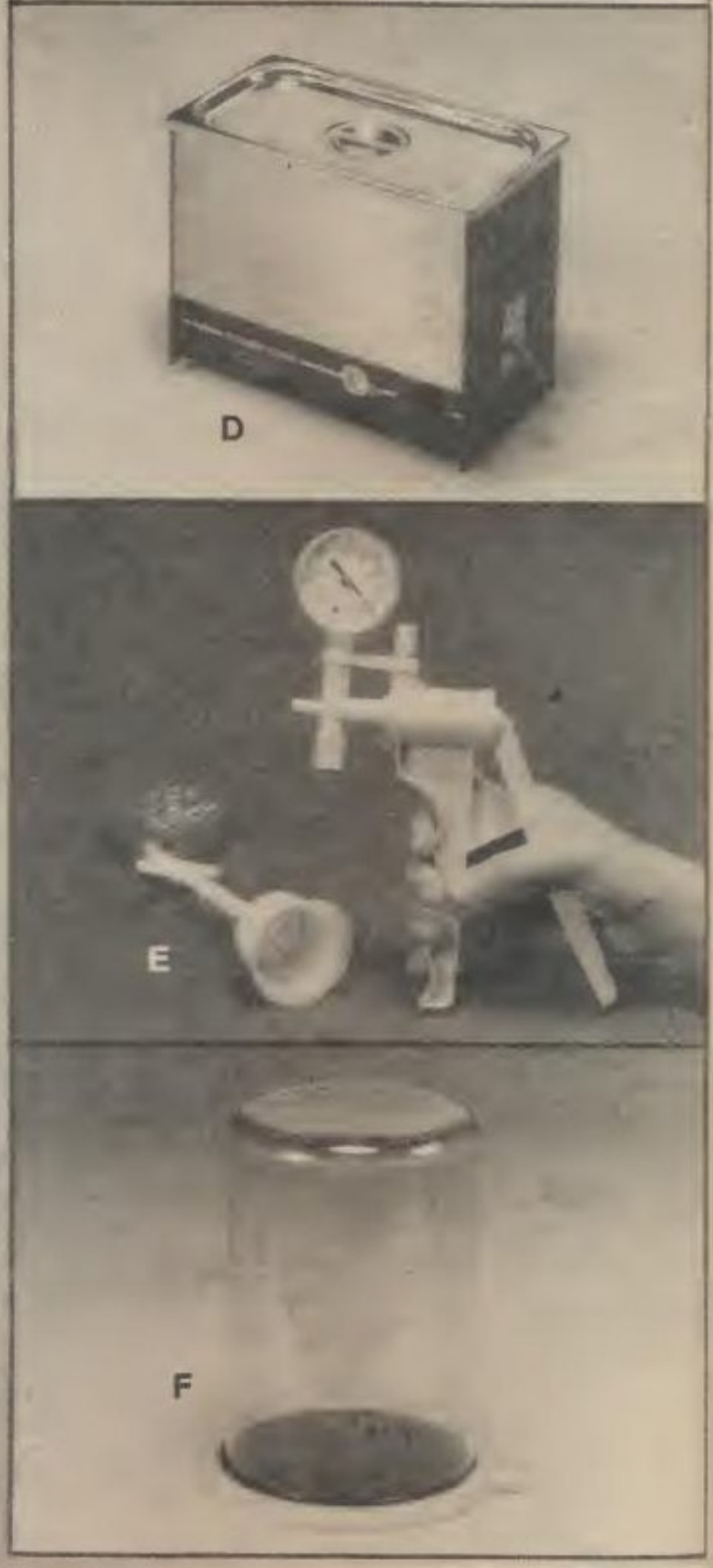
No. 71,301 $29.95

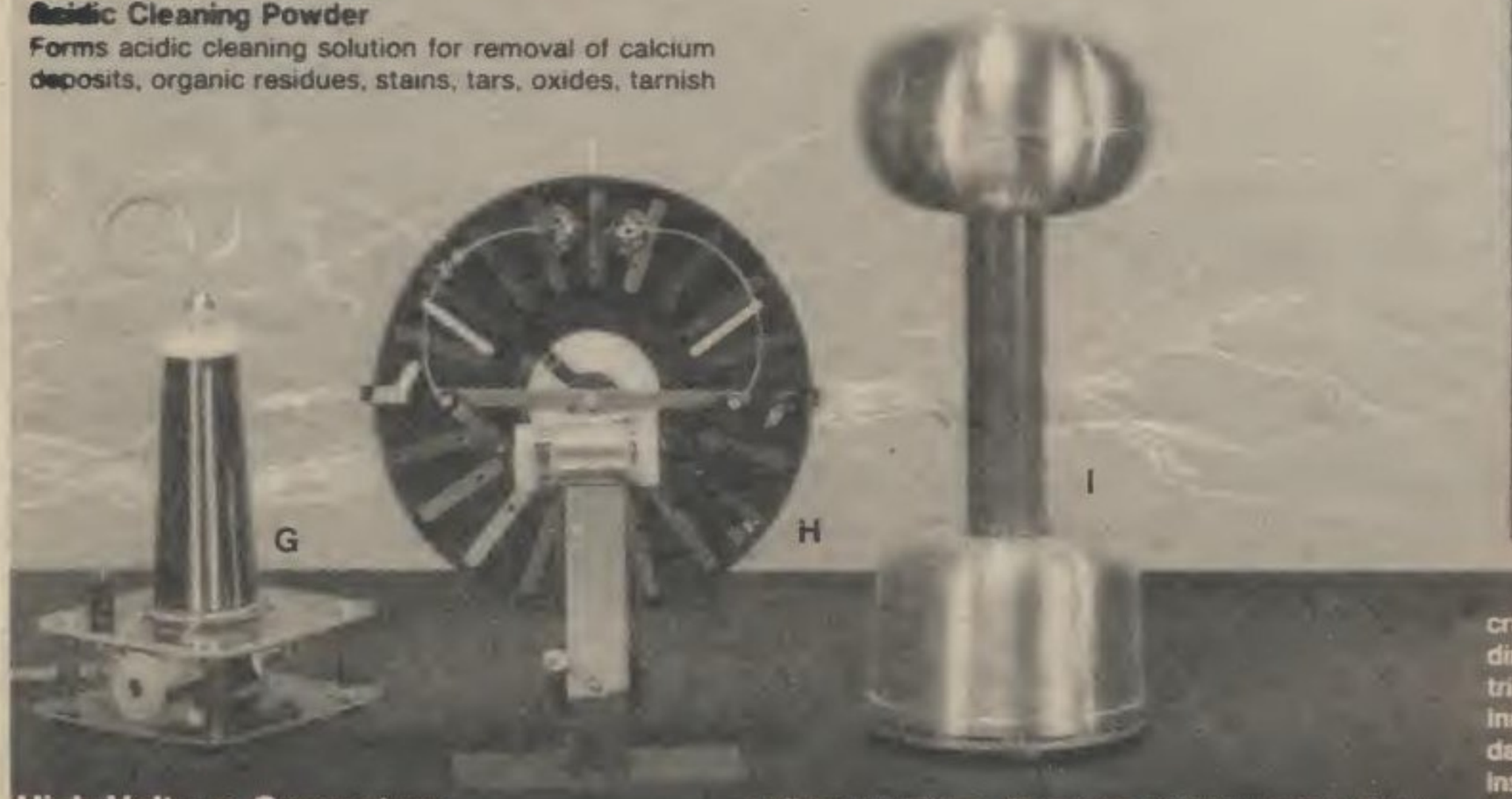
Pump Only (no gauge) **No. 71,300 $14.95**

(F) Complete Vacuum Jar Withstands Full Vacuum

***Ideal for Labs**

This clear polycarbonate bell jar is equipped with a gasketed, polyethylene base & a permanent, fused-in, ¼" tubing connection. Jar: 9 x 6⅜" I.D. Base: ⅛ x 7½" diameter. Neoprene gasket: $^{3}/_{32}$ x 7" diameter with ½" center hole. **No. 71,338 $33.50**





High Voltage Generators

(G) Tesla Coil

***A Great Classroom Demonstrator . . . Includes 21 Experiments.**

Radiate high frequency energy through space or light fluorescent tubes 2 ft. away with this high frequency generator. Unit has coil capacitors & air core transformer, ball electrode, insulative base, protective plastic cover & cord. Comes equipped with small neon lamp, discharge electrode, 2 radiation antenna plates & instruction booklet for experiments. A very high frequency is produced in the form of decrement waves resulting in output rich in harmonics. Socket for standard bulbs enables you to connect these or similar radiator to coil top. Generates 50,000 V. 115 V. 60 Hz. 14x6x6" in size. **No. 70,301 $89.95**

(H) Edmund's Famous Electrostatic Generator

An electrostatic generator coupled with ion acceleration may provide the propulsion system when man eventually probes beyond the near planets to the outer reaches of the solar system. Science teachers have told us how efficient they have found this low-priced, high quality generator. It demonstrates scientific principles as well as far more expensive units that have been used in schools for decades. Known as the Wimhurst Static Machine or Influence Machine, it is ideal for use in many chemistry, electricity & physics experiments. Turn the crank handle & two 9" plastic discs rotate in opposite directions. Metal collector brushes store static electricity in the Leyden Jar condenser until discharged. Includes discharger, 2 luminous plates, jingle bell, dancing balls, lightning rod, 2 electric whirls & complete instructions. 14" high. **No. 70,070 $39.95**

(I) 200,000 Volt Van de Graaff Generator

***A Classic Demonstrator of Electrostatic Energy**
***Ideal for Science Classes and Lab Work**

Demonstrate lightning, lightning rods, St. Elmo's Fire, the repulsion of like charges, electrostatic dust collection, the flow of ions and the classic "hair raising" shocker. This deluxe, high quality generator is 17" tall and is equipped with a 6¾" aluminum top ball. Powered by a 5,000 rpm 110 V AC motor, it has a humidity range of 0–90% and generates a current of 1.5 to 2.5 microamps. Aluminum base housing, frame & charge collector. Unbreakable plastic insulating column. Comes assembled with instructions. **No. 70,264 $89.95**

Extra Band **No. 42,012 1.50**

(A) Superior Optical Performance, Best Buy Microscope For Beginners **Only $59.95**

Three Turret–Mounted Achromatic Objectives: A key reason why this model is rated so high! Ordinary microscopes use simple lenses that cause annoying color fringes. Achromatic objective lenses correct this distortion so you see the real colors of your specimen—and unlike most low–priced microscopes, this model has 3 achromatic objectives: 5X, 15X and 30X. **50 to 300X Magnification Possible:** Ideal for the beginner. 50X is perfect for examining insects; 150X for identifying minute features; 300X is high enough to see many bacteria.

Unlimited Home Experiments Now Possible: People with varied interests can use this microscope for practically any type of amateur home research project. Also excellent for science fair & engineering projects for students at every level. Special features include helical rack & pinion focusing and wooden storage case. We have marketed this microscope for many years & heartily endorse its use by beginners. **No. 70,008 $59.95**

Beginner's Book "Hunting With The Microscope". A thrilling intro. to the microscope showing what to look for and how to go about it. Covers many specimens. 125 pp. Paperbound. **No. 9207 Only $2.25**

For More Accessories See Page 42.

(B) Microscope With Accessory Kit

You save over $5.00 when you order the Accessory Kit with the above Microscope. Buy both and save! Sells separately for $19.95. See Page 42 for details on Kit.

For both Microscope & Kit order
No. P–72,445 Only $74.88

(C) High Quality, Low–Priced Microscope

***An Excellent Instrument With Wide Magnification Range**

Designed for those just starting out in home and school study of microscopy, this instrument has many of the features needed to accommodate a student as his knowledge grows. It features:

- ***All metal construction**
- ***Dual knob helical rack & pinion focusing**
- ***Adjustable objective lens down–stop**
- ***3" x 3⅛" stage**
- ***Adjustable slide holding clips**
- ***Coated optics**
- ***Fine focus**
- ***Adjustable arm for altering viewing angle (0 to 90°)**
- ***Substage, click–stop adjustable diaphragm with 6 apertures**
- ***Revolving 1⅜" dia. plano & concave sub–stage mirror**
- ***Interchangeable 10X & 15X eyepieces**
- ***3 position, click–stop objective turret**
- ***3 achromatic objectives: 5X, 20X and 40X**
- ***Hardwood storage and carry case**

No. 72,405 Only $139.95

(D) Medium–Duty Student Microscope

***50X To 600X Magnification**
***Ideal for Classrooms, Jr. & Sr. High Labs**
***More Substantial, Full–Feature Monocular Design**

Ideal for intermediate and secondary school projects, classrooms & laboratories where a large number of students are given "hands–on" experience. This model is a larger, heavier version of the beginner's microscope. Weighs over 3½ lbs. and features a larger stage and broader base. It's designed to stand up to rough use experiences in introductory biology courses. Its features include:

- ***All metal construction**
- ***4 x 3" stage**
- ***Adjustable slide holding clips**
- ***Substage click–stop adjustable diaphragm with 6 apertures**
- ***Revolving 1⅜" dia. plano–concave substage mirror**
- ***Dual knob rack & pinion focusing**
- ***Dual knob fine focus adjustment**
- ***Hardwood storage and carrying case**
- ***Adjustable objective lens down–stop**
- ***Adjustable incline arm for convenient table–top use**
- ***Interchangeable 10X wide field and 15X eyepieces**
- ***Three–position, click–stop objective turret**
- ***Three achromatic objectives, 15X, 10X and 40X**
- ***Coated optics**

No. 72,406 Only $179.95

Buyers Guide
TO MICROSCOPES

What qualities should you look for in a microscope?

1.) **Stand:** Should be high–quality metal & sturdy.

2.) **Objectives:** Removable, interchangeable. Standard size is best. Powers vary. Quality improves with coated achromats and retractable nosepieces.

3.) **Eyepieces:** A 10X regular field (Huygenian) is considered standard. 5X, 15X and other eyepieces available for specialized jobs. Wider field (W.F.), precision polishing coating and interchangeability are features of the best eyepieces.

4.) **Stage:** The platform that holds your specimen slide is very important. Basic stage should be a sturdy, practical size with firm holding clips. Better microscopes accommodate a separate, attachable mechanical stage for precision positioning of the slide.

5.) **Focusing Adjustments:** Minimum requirement should be rack and pinion focusing. Smooth dual–control coarse & fine adjustments are quite desirable. Parfocal ability (no need to re–focus on changing objectives) and interpupillary adjustment for binocular nosepieces found on top quality instruments.

6.) **Substage Equipment:** Regardless of quality, every microscope should be equipped with either a plano–concave mirror or illuminator. Mirrors are fine if used with detached light sources of good quality. Diaphragms may be added to concentrate the light source, while more sophisticated micrography will require condenser lenses, iris diaphragms or full Abbe condenser systems.

7.) **Final Hint:** Clear, sharp image quality is more important than a distorted, poorly resolved field at a higher power.

(A) Quality Teaching Microscope With 2 Achromatic Objectives—$279.00

This American made high quality microscope was built to meet the needs of science & elementary school courses. It includes important features often found only in higher priced laboratory instruments. Features include:

- **Working powers of 100X and 430X**
- **Coarse & fine focusing, revolving nosepiece & 4–position stage**
- **Stage measures 4½" x 5½"**
- **10X (0.25 n.a.) and 43X (0.55 n.a.) parfocal achromatic objectives**
- **diaphragm & a removable 15 W substage illuminator**
- **Standard diameter eyepiece (10X)**

All necessary instructions included. If you need a high-quality teaching microscope, check this precision instrument at this special price! **No. 72,377 $279.00**

(B) Professional Quality 3 Objective Microscope

This precision microscope is excellent for high school and college laboratories. All optical elements are standard, professional size. 5X (0.10 n.a.); 10X (0.25 n.a.); 60X (0.85 n.a.) coated objectives are parfocal. Built-in focusing stop prevents damage to objectives & slides. Unique feaures include:

- **Fixed 160 mm tube**
- **Rack & pinion coarse focusing & micrometer type fine focusing**
- **1⅞" plano–concave mirror**
- **3 eyepieces (10X WF, 5X & 15X)**
- **Fixed condenser lens**
- **Iris diaphragm**
- **Protective hardwood cabinet with handle**
- **Shipping Wt. 11 lbs. (5 kg.)**

For teachers, students or anyone who needs a top quality microscope—an excellent value!

No. 85,049 $349.95 T.C.C.

Note: We recommend an attachable substage illuminator (No. 50,222) which fits the mirror pin socket of this microscope. For complete information on accessories see Page 42.

(C) American Made Zoomscope Zooms From 25–100X

This instrument is excellent for industrial use where opaque items are being inspected & for other detailed observations. Its many features include:

- **50 mm dia. substage illumimator with fork mounted reflector**
- **Field of View: 5.7–1.43 mm**
- **3¾" stage with clips**
- **Working distance: 6.6–15.4 mm**
- **Fixed objective & eyepiece**

Instructions included. **No. 72,378 $131.95**

NEW!

G

(D) 4 Objective Laboratory Microscope

This precision instrument is designed for routine laboratory work in hospitals, medical colleges, pharmaceutial labs and industry.

Specifications:

Objectives:	Parfocal, centered achromats 5X, 10X, a springloaded 45X, oil-immersion 100X.
Oculars:	5X Huygenian & 10X wide field.
Magnification:	25X to 1000X.
Focusing:	Dual knob rack & pinion coarse focus & fine focus; dual focus & adj. downstop.
Nosepiece:	Quadruple w/detent for accurate centering.
Stage:	120x120 mm w/removable mech. stage affording 70 x 40 mm movement.
Illuminator:	Plano/concave mirror on gimbal mt. w/bright field condenser, iris diaphragm, filter support, rack & pinion adjustment.
Monocular:	Mounted on incline arm adjustable through 90°.

No. 85,323, 14 lbs. (6.4 kg.) **$399.95 T.C.C.**

(E) 4 Objective Binocular Microscope

For use in pathology, hematology, bacteriology, research & general laboratories, it provides crisp, sharp images to the edge of the field!

Specifications:

Objectives:	Parfocal, centered achromats 5X, 10X, 45X & 100X.
Oculars:	Matched 10X wide field.
Magnification:	50X to 1000X.
Focusing:	Focusable specimen stage with dual knob coarse and fine rack & pinion movement.
Binocular:	Rotatable body w/adjustable interpupillary distance & diopter focusing.
Nosepiece:	Quadruple on ball bearing mount.
Illuminator:	Utilizes Koehler principle w/focusing adj. & filament alignment adj. 115 V AC. **No. 85,322 $895.00 T.C.C.**

(F) Stereo Microscope: 10–60X "New ESC Value"

Edmund Scientific is proud to offer this fine stereo microscope. Its many features include:

- **Binocular head w/inclined eyepiece tube**
- **Sliding paired objectives 2X & 4X for quick change**
- **Wide flat field of view**
- **Interpupillary distance adj. 55 to 75 mm.**
- **Diopter adj. on left eyepiece tube & high resolving power**

This stereo microscope also offers long working distance and great depth of field! Magnification 10X–60X.

No. 72,490 $495.00

(G) "NEW" Zoom Microscope Set With Photograph Viewer

This unique microscopy set comes complete with a Zoom Eyepiece 10–20X and a special viewer/photography set and instruction sheet. And that's not all—it also includes a built-in illuminator and AC adapter jack (batteries not incl.) and achromatic objective: 5X, 12X, 40X, 60X. Now you can learn how to photograph the microscopic world. This all–in–one set is gift–packed.

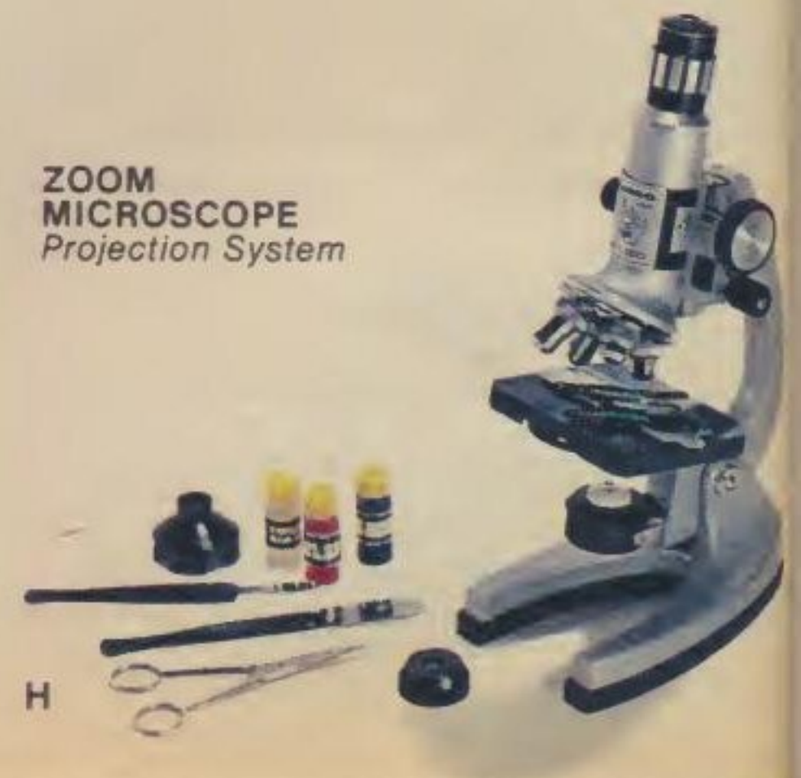
No. 72,462 $89.95

(H) Zoom Microscope With Improved Projection System!

This zoom microscope features a projection system that lets you easily project the image by utilizing an internal mirror & twist knob. A built-in lamp lets many students simultaneously view an objective-magnified slide on a small screen, wall or flat surface. Scope has: revolving turret w/4 objectives (5X–0.06 n.a., 12X–0.16 n.a., 40X–0.35 n.a., 60X–0.65 n.a.) & magnification calculator; coarse & fine focusing; 10X–20X zoom eyepiece; magnetic stage w/condenser lens, aperture & filter selector. Incl. dissecting tools, magnifier, rock & crystal specimens, stains, shrimp eggs, hatchery, case & more. (Req. 2 batts. not incl.) **No. 72,362 $149.95**

24-Hour Phone Service for MasterCharge, VISA and American Express cardholders!
DIRECT LINE TO ORDER DEPARTMENT
(609) 547-8900 – 8am-5pm EST/EDT Mon.-Fri.
(See Page 50-C For Telephone Ordering Information)

ZOOM MICROSCOPE
Projection System



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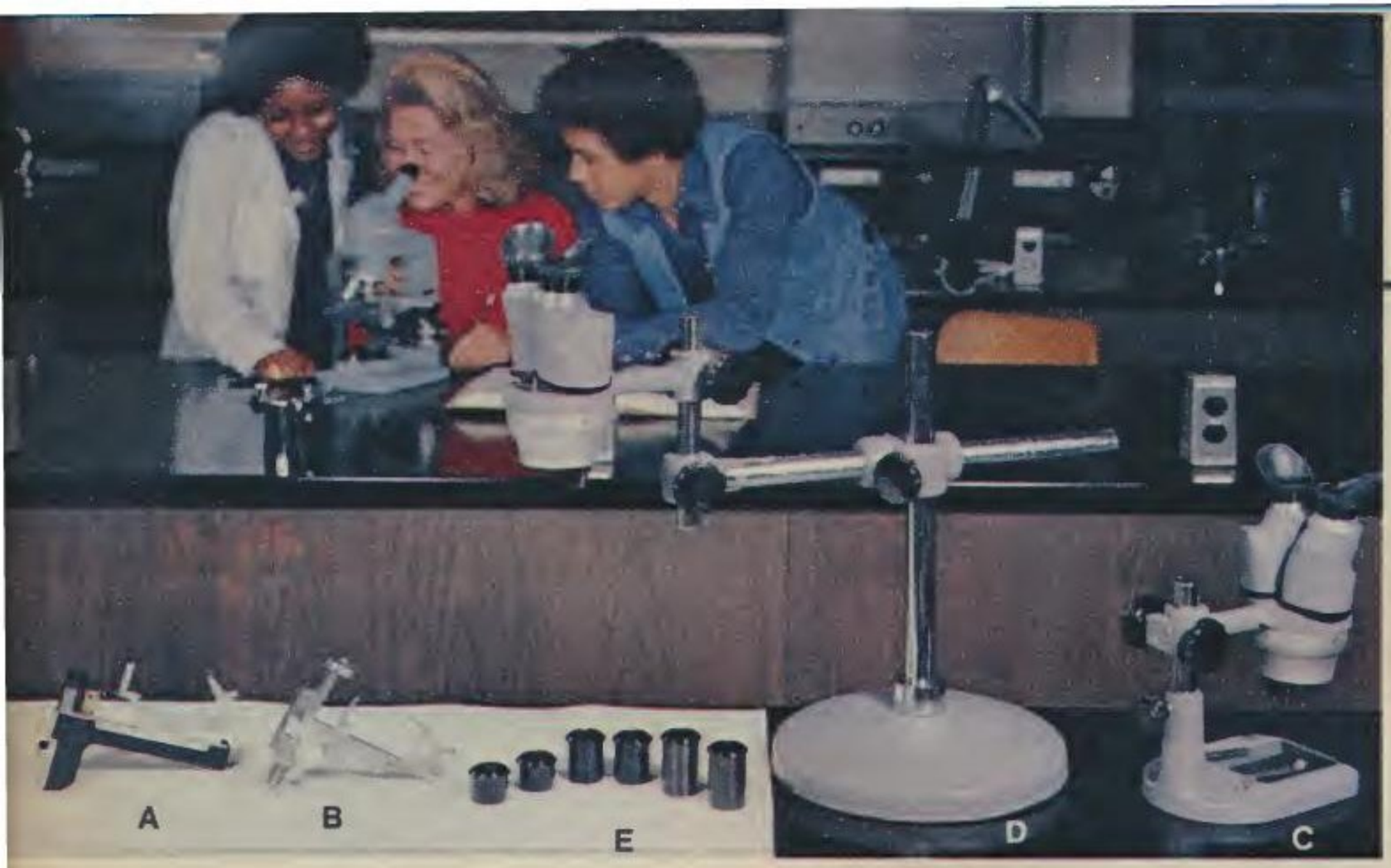

Precision, Graduated Mechanical Stage

***Makes Low-Cost X-Y Positioner**

This precision instrument has 30 mm front to back and 50 mm left to right excursions. Fixed verniers read to 0.1 mm. Dual control knobs, horizontally positioned, are conveniently located on right side. The slide holder with adjustable arm & spring clip accepts both small and large glass slides up to a maximum opening of 3¼". Finished in black & chrome. Two locating pins and thumb screw attach to the microscope stage which can be easily drilled to accommodate them. Can be adapted to make a low-cost X-Y positioner.

No. 30,058 $69.95

(A) High Quality Microscope Stage

- Originally sold for $200 . . . now only $99.95!
- High Quality . . . precision-tooled
- Converts into X-Y positioner
- Coaxial control knobs; graduations from 0-10 microns
- 150 x 100 x 10 mm
- Specially designed to fit Nikon microscopes

No. 72,173 $99.95

(B) Attachable, Graduated Mechanical Stage

Sturdy mechanical stage has spring finger which holds standard 1 x 3" microscope slides.

- Fits microscopes w/stages up to 10 mm thick
- 35 mm front to back & 65 mm left to right excursions
- Fixed verniers reading to 0.1 mm
- Dual control knobs—comfortably positioned

No. 30,060 $39.95

Quality American Made Stereoscopic Microscope Provides A Three Dimensional, Erect Image

All These Quality Features

- *Paired, 10X Wide-Field Eyepieces Complete with Light Shields
- *Paired 2.3X and 4.0X Achromatic Objectives (see table below)
- *Coated Optics, including Porro Prism Erecting System
- *Revolving Nosepiece
- *Rack & Pinion Focusing
- *Interpupillary Distance Adjustment
- *Aluminum Body and Cast Iron Base
- *Removable Glass Stage with Clips
- *Long Working Distance

This stereo microscope provides wide-field binocular vision and three-dimensional, erect images. Unlike other microscopes which give inverted images, when a specimen is moved on this stage you observe it moving in the same direction through the eyepiece. Scientists, educators and research personnel find a stereo microscope superior for observing whole objects such as embryos, insects, rock specimens or material samples. Up to 80X is typically used. In industry, the stereo microscope is excellent for assembly, quality control, production line inspection and research.

A stereo microscope is actually two microscopes mounted side-by-side with paired objectives, eyepieces and tubes. This gives you stereoscopic vision so that you can see objects in three dimensions. This particular stereo microscope has a long working distance and is ideal where work has to be performed on the object under the microscope.

Standard Optical Equipment

Objectives	Working Distance	Eyepieces	Field Dia.	Total Power
2.3X	3"	10X	0.31"	23X
4.0X	2"	10X	0.18"	40X

Choose The Microscope With The Base That Fits Your Needs!

(C) Microscope With Standard Base.

Shpg. Wt. 10 lbs. (4.5 kg.) **No. 85,056 $299.95**

(D) Microscope With Heavy Duty Base Extension Arm

Allows microscope to swing 360° with maximum radius of 22"; 14" vertical travel. Pillar/horizontal arm has locking screws for each adjustment; circular locking collar permits arm to rotate freely. Focusing post is lockable in any position. Heavy cast iron base for added stability. Shpg. Wt. 45 lbs. (20.9 kg.)

No. 85,161 $349.00 T.C.C.

Heavy Duty Base & Extension Arm only.

Shpg. Wt. 42 lbs. (19.1 kg.) **No. 85,040 99.95 T.C.C.**

(E) Wide-Field Eyepieces For Stereoscopic Microscope

- *Excellent for more exacting work
- *Makes your microscope even more versatile & easier to use

Power	Total Mag.	Field Dia.	Number	Price/Pair
6X	14 & 24X	0.38 & 0.22"	30,213	$34.50
10X	23 & 40X	0.31 & 0.18"	30,214	34.50
20X	46 & 80X	0.22 & 0.13"	30,217	54.95

Fit stereoscopic microscope above (No. 85,056).

Microscope Accessories

Made in England—Microscope Eyepiece Reticles

Standard 21 mm Dia. (0.825") 1.5 mm Thick

30,101	With 0.1" scale in 100 parts	$19.95
30,110	With 0.5" scale in 100 parts	19.95
30,081	1 mm horizontal scale in 100 parts	19.95
30,068	5 mm horizontal scale in 100 parts	19.95
30,073	0.5 mm squares over entire field	19.95
30,111	1 mm squares over entire field	19.95
30,066	10 mm horizontal scale in 100 parts	19.95
30,072	0.25 mm squares over entire field	19.95
30,076	Crossline scales; 5 mm in 100 parts	19.95
30,075	Crossline scales 100 parts; 1 mm divisions	19.95
30,070	Crosslines; standard rulings	19.95
30,077	Concentric circles; 0.5 mm to 12 mm	19.95
30,079	Protractor	19.95
30,083	Patterson globe & circle (air pollution)	29.95
30,084	Porton reticle	29.95
30,270	Fairs type No. 3	29.95

Microscope Stage Micrometers:

Reticle scales are all mounted on 1 x 3" standard glass slides and protected with a cover glass.

Number	Description of Pattern	Price
30,133	10 mm scale in 100 parts	$25.95
30,085	5 mm scale in 100 parts	25.95
30,088	1 mm. sg. in 100 part grid numbered horizontally, lettered vertically	25.95
30,593	0.1 mm scale in 50 parts	49.50
30,086	0.1" scale in 100 parts	25.95
30,592	0.005" scale in 50 parts	29.50
30,036	1 mm scale in 100 parts	29.95
30,683	1 mm scale in 50 parts	17.25

Cross Hair Reticle, 40 mm dia., 3.5 mm thick **No. 30,645 $6.25**

Illuminators For Every Purpose

(F) Adjustable Multi-Purpose Microscope Illuminator

Ideal for microscopes, the adjustable sliding arm folds to 3" & extends to 11". Great for illuminating small objects like stamps & coins. Bulb & case included. 25 W, 115 V AC, 60 Hz. Black/Chrome. **No. 42,567 $28.95**

(G) Push-In Substage Illuminator W/Screw Base Lamp

Fits into substage mirror socket. Includes daylight filter & extra bulb. 110 V AC, 20 W single contact screw base lamp. 6 ft. cord w/plug & on/off switch. Fits No. 85,049.

No. 50,222 $59.95

We Care About You! We critically screen every company who wants to use our mailing lists so that we can limit the mail you receive to only that which we think you will appreciate. **You have a choice...**if you wish, we will gladly see that your name is not made available to other companies. Write our **Mail Preference Supervisor** (See Pg. 50-B for complete details). Member: **Direct Mail Marketing Association**

Microscopes

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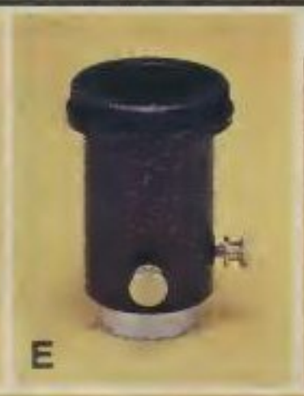
C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(A) Our Own Microscope Accessory Kit
Kit includes book, "Hunting With The Microscope," prepared slides, well slide for use w/liquids, "make your own" slide kit of glass slides, cover glass & balsam, polarizing filter set, stains, shrimp eggs & instructions. **No. 70,504 $21.95**

Make Your Own Microscope Slides
72 Plain Glass Slides, 1 x 3" **No. P-40,001 $2.00**
100 Slide Cover Glasses, 18 mm sq. Class 1 (0.17 mm thick) **No. P-40,002 $4.95**

Well Slides. 2 depressions on ea. slide protect specimens from damage by tight cover glass or use w/live water cultures. Pkg. of 12 **No. 30,091 $9.95**

"Make Your Own" Slide Kit. Asst. of 30 1 x 3" glass slides, 30 cover glasses (18 mm sq.) & vial of balsam cement. **No. 40,260 $9.75**

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(B) Prepared Slide Set: Fine introduction to microscopy. 18 slides (1 x 3") & 48 pp. explanatory bk. fruitfly, plankton, & more! **No. 41,745 $21.95**

(C) Zoom Microscope Eyepiece 10X to 20X
Fits all standard microscopes; eliminates eyepiece changing. Insert in microscope with 3X & 10X objectives & immediately get 30–200X. Well-made, all metal mount, heavily plated, anodized. Adjustable clamping ring. Overall length 2¾"; max. dia. 1½". Coated.
No. 60,270 $79.95

"Photography Through The Microscope". An excellent 76 pp. guide to photomicrography. **No. 9103 $3.25**

Microscope Eyepieces, Camera Adapters, Objectives

(D) Standard Eyepieces (0.917" O.D.) While Huygenian eyepieces are most commonly used in microscopy, periplan eyepieces give flatter field & are excellent for use w/achromatic & apochromatic objectives. Recommended for photomicrography.
**Huygenian; *Periplan; †Coated

Number	Power	Price	Number	Power	Price
30,126	5X	$12.95**	30,130	20X	$49.95*†
30,128	10X	24.95**	30,131	25X	59.95*
30,129	15X	39.95**			

0.917" O.D. Ramsden Eyepieces

6 mm f.l.	No. 30,195	$ 8.95
12.7 mm f.l.	No. 30,198	9.95
25.4 mm f.l.	No. 30,194	10.95
25.4 mm f.l. w/etched glass crossline reticle	No. 30,334	12.95

(E) Take Pictures Through Your Microscope
Attach correct camera adapter listed on page 16 to this "T" adapter which fits & locks on eyepiece tubes up to 0.991" O.D. Microscope eyepiece fits through "T" adapter which attaches to camera adapter. Fits Nos. 72,405, 72,406 & 85,049 microscopes. Complete instructions included so that with your SLR camera and your microscope, you can master photomicrography!
No. 41,100 $11.95

(F) Achromatic Objectives: Give remarkably crisp images, free from residual color. Each designed for tube length of 160 mm & cover glass thicknesses of 0.18 mm. Standard thread.

Number	30,045	30,046	30,047	30,048	30,049
Power	5X	10X	20X	40X	60X
N.A.	0.10	0.25	0.40	0.65	0.85
Price	$21.95	$29.95	$39.95	$49.95	$59.95

(G) Oil Immersion Objective Lens—Only $89.50!
Provides superior resolution of high magnification & high aperture objectives by eliminating air space which normally limits resolution of these objectives. 100X, 1.25 n.a., standard thread, spring-loaded retractable nose. **No. 41,670 $89.95**

(H) Substage Iris Diaphragm: Blued steel leaves in brass mount. 1–25 aperture. Swing-in holder for filters 32 mm dia. x 1½ mm thick. Threaded shoulder 28 mm dia., 5 mm pitch. **No. 40,997 $14.95**
See page 71 for our full line of iris diaphragms.

(I) Microscope Slide Holder: Be more organized & efficient; prevent loss/damage to slides. Chemical & stain resistant, high density polyethylene. Washable, non-porous surface w/slots cut at 10° angle to provide greater slide stability & clear viewing of slide I.D. number. **No. 42,754 $12.95**

(J) 9 Specimen Assortment For Dissecting: crayfish, frog, grasshopper, perch, starfish, earthworm, clam, beetle & grantia sponge. **No. 71,645 $7.95**

(K) Dissecting Pan & Pins: Sturdy alum., 11½ x 7½ x 1½", lined w/reusable black dissecting wax. 4 pins & instructions included. **No. 71,652 $3.95**

Nutrient Agar: General purpose growing medium for bacterial cultures. 6 oz. **No. 41,815 $5.75**

Disposable Plastic Petri Dishes & Covers: 15 mm high x 100 mm dia. Pkg. of 20. **No. P-71,614 $5.50**

(L) Microscope & Dissecting Accessories: 7 piece set includes scalpel, scissors, probe—everything you need! Portable! **No. 50,002 $7.00**

Raise Live Protozoa: Thousands of dried cysts (3 packets), food papers & methyl cellulose. Activate with water. Safe! **No. 40,708 $3.50**

Ronchi Rulings Test Your Microscope's Precision
Evenly spaced parallel lines etched on glass provide an easy way to test your microscope for precision. Simply focus on the ruling & see whether lines appear sharp & parallel all the way to the edge of field of view. Excellent for checking uniformity & flatness and calibrating the field of view. 1 x 1" size.

100 lines/inch	No. 30,513	$2.05
200 lines/inch	No. 30,516	2.95
300 lines/inch	No. 30,518	4.25

For other sizes, see page 73 under "Optical Testing".

(A) 60X Direct Measuring Microscope

· Dual Scale Reticle
· Rack & Pinion Focusing

Ideal as an inspection and measuring instrument in labs, workshops and assembly lines, this model offers a dual scale reticle and an adjustable, battery–operated illuminator. Comes complete with hardwood case.

Specifications

Magnification:	60X
Reticle:	Graduated 0 to 0.1″ in 0.001″ divisions & 0 to 2 mm in 0.02 mm divisions
Focusing:	Reticle, twist focus Subject, rack & pinion
Base:	1 1/16″ dia. with cutaway for subject manipulation
Illuminator:	Battery-operated penlight mounted on adjustable arm

No. 61,193 $199.95

(B) (C) Direct Measurement Microscopes For Close Examination

These powerful, pen–sized microscopes are available with a measuring glass reticle in metric or inch scales. Each stands only 4¼″ high & weighs just 2 oz. The optional clear plastic base (1½″ O.D.) converts the unit to a free–standing microscope which can be focused and locked. These extremely versatile instruments can be purchased with the equipment that best suits your needs: basic unit without reticle & base, basic unit with metric or inch reticle, and basic unit with your choice of either metric or inch reticles & clear lucite base. Each is 50X and will give you quick, efficient examination of any item that requires close scrutiny. Ideal for linear measurement:

Lucite Base	Reticle Length	Divisions	Number	Price
Yes	1/10″	0.001″	60,465	$29.95
Yes	2.5 mm	0.01 mm	61,210	29.95
No	1/10″	0.001″	30,225	23.95
No	2.5 mm	0.01 mm	42,215	23.95
No	None	None	30,013	14.95

(D) Direct–Reading Zoom Microscope

· Calibrated Crossline Reticle

A quality instrument for engineers, quality assurance inspectors, and others working with small, delicate parts, this unit features smooth, camera lens type focusing collars. Wooden case included.

Specifications

Magnification:	20X to 30X
Objective:	2X lens
Ocular:	10X to 15X zoom
Focusing:	Objective, twist–focus collar Ocular, twist–focus collar Reticle, locking collar
Reticle:	Zero centered linear scale calibrated from 0 to 0.053″ in 0.001″ divisions with every 0.010″ numbered; 90° crossline, numbered 30°, 45° & 60° angles
Illumination:	External, 1⅞″ I.D. clear acrylic base, 2″ high

No. 42,654 $119.95

(E) Free Standing Microscopes

These highly accurate microscopes feature fully coated optics, precision focusing & protective wooden case. Ideal for industrial inspection!

25X Microscope
4 mm (0.160″) field of view
Height: 4¼″ closed

No. 42,692 $54.95

50X Microscope
2 mm (0.080″) field of view
Height: 3⅞″ closed

No. 42,693 62.95

(F) Multi–Purpose Optical Instrument

This high quality, palm–sized instrument can be used as a 3X telescope, as a 3X, 5X & 10X magnifier–loupe, a 15X loupe, or as a 25X & 30X microscope! Combine the distortion–free, 3–element system to fit your need. Instructions are included. Features black aluminum housing, a clear acrylic loupe stand & a carrying case. Ideal for stamp & coin collectors, sports & theater buffs!

No. 42,476 $39.95

(G) Measure Directly With Erect Image Low Power—4X, 10X & 20X Microscope

ESC Recommended

· Long Working Distance
· Separate Scales for 10X & 20X

Tool rooms, labs, inspection departments & printing shops are but a few of the many places where this sturdy, American–made direct measuring microscope can be used. It provides accurate measurements at 10X and 20X and also allows general inspection of small components at 4X. A quality instrument, it has excellent color–corrected optics and a straight–through image erector. The versatile focusing mount allows the unit to be used quickly and easily in any location.

Specifications

Magnification:	4X, 10X, 20X
Reticle:	10X—graduated 0 to 0.4″ in 0.005″ divisons 20X—graduated 0 to 0.2″ in 0.0025″ divisions
Focusing:	Rack & pinion
Working Distance:	4X—8½″ 10X—2⅝″ 20X—1⅜″
Field of View:	4X—1¼″ 10X—½″ 20X—¼″
Base:	horseshoe type

No. 72,469 $139.95

Although this microscope comes equipped with a 28 mm RKE® eyepiece, you may wish to increase its versatility with greater magnification. This can be done by using either of the optional eyepieces indicated in the chart below. Please refer to page 11 for further information about these eyepieces.

System Magnification

28 mm RKE®	4X for system
*15 mm RKE®	8X for system
* 8 mm RKE®	14X for system

*not suitable for reticle

Magnifiers

Buyers' Guide
TO MAGNIFIERS

Magnifiers And Their Uses

Magnifiers have many applications for industrial production line inspection, reading small scales, examining surfaces, and the like. They are also important to hobbyists and invaluable appraisal & authentication aids to collectors. In schools, magnifiers help to explain many scientific and natural phenomena.

Various types of magnifiers, such as the watchmaker's loupe and the linen tester, are available for special uses. We offer a broad & complete line of industrial and hobbyist magnifiers so that your choice does not have to be limited.

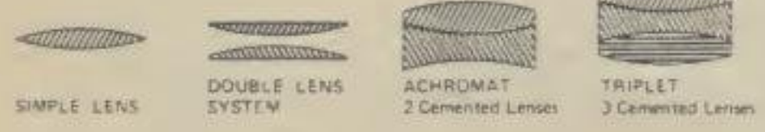
The Perfect Magnifier . . . An Impractical Dream

A perfect magnifier would be lightweight, have a large diameter, provide a wide viewing area and offer high, distortion-free magnification. Incorporating all of these features into one unit is optically impossible, however. The magnifying power of a lens depends on its focal length (f.l.). The focal length, in turn, depends on the lens curvature; the greater the curvature, the shorter the focal length and the greater the power.

In the design of a simple, inexpensive magnifier, the lens diameter will typically decrease as the curvature increases to provide higher power. Conversely, as the curvature is decreased to lower the power, the diameter generally increases with a resulting increase in viewing area. In addition, distortion generally increases with an increase in curvature. Thus, a magnifier with a large diameter typically offers more viewing area and less power, and one with a small diameter offers less viewing area and higher power. So, both wide field of view and high magnifying power cannot be incorporated into a single design without elaborate, weighty, high-cost lenses.

Basic Magnifier Optical Systems

Number of Elements. The single lens is satisfactory for low powers. Higher powered magnifiers require two or more lens elements for improved resolution and correction of chromatic or other aberrations.



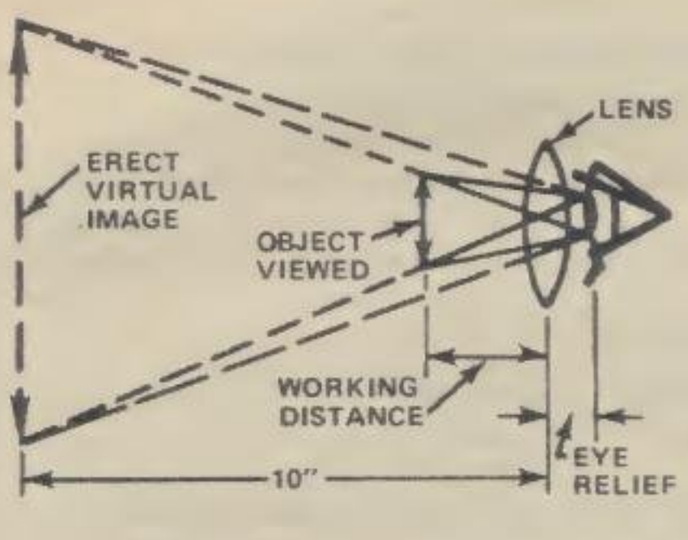
Working Distance is the distance between the examined object and the magnifier when the latter is in focus. Usually, a magnifier must be held a little closer to the object than its focal length. The working distance may be expected to be approximately near the focal length of the magnifier.

Eye Relief is the maximum distance the eye can be from the magnifier and still provide a full field of view. Longer eye reliefs generally provide more comfortable viewing.

Field of View is the area seen through the magnifier. As power increases, lens diameter and field of view decrease. At 5 power (5X), field of view is about 1½". At 10 power (10X), it is about ½". Usually, it is best to use low power for scanning surfaces and high power for checking small areas.

Depth of Field is the distance between the closest and farthest points at which a magnifier in a fixed position stays in focus. It is a valuable feature for examining uneven surfaces such as rock specimens. The depth of field decreases as power increases.

Coating. Lens surfaces coated with special anti-reflection coatings will reduce light loss and are particularly useful for low light level applications.



Magnification. The above sketch shows your eye looking at a close object. 10" is assumed to be as close as you can focus for comfortable vision. An object only 1" from your eye would be 10 times larger, but out of focus. A magnifier's function is to make this close view possible. Since a 1" focal length lens brings clear vision down to 1" from the eye, an object at this distance is clearly seen, and appears to be 10 times larger than it does when viewed from 10" away. Such a magnifier is commonly called 10X or 10 power.

The actual magnifying power will vary slightly, depending upon working distance, eye relief distance and the characteristics of the observer's eye. To calculate magnifying power, the following approximation formulas are used:

$$M = \frac{10 \text{ inches}}{\text{f.l. (inches)}} + 1 \text{ or } M = \frac{254 \text{ mm}}{\text{f.l. (mm)}} + 1$$

The resulting magnification from these formulas is accurate to within 1 unit of magnification achieved for any observer.

FREE! Write to the Marketing Division for a free copy of our new **"Buyer's/Owner's Guide To Magnifiers"** (No. 9951).

"All About Magnifiers", by Sam Brown
An invaluable, comprehensive book which includes such topics as magnifier optics, constructing magnifiers, mirror magnifiers, telemagnifiers, and much more. 20 pp.
No. 9002 $.95

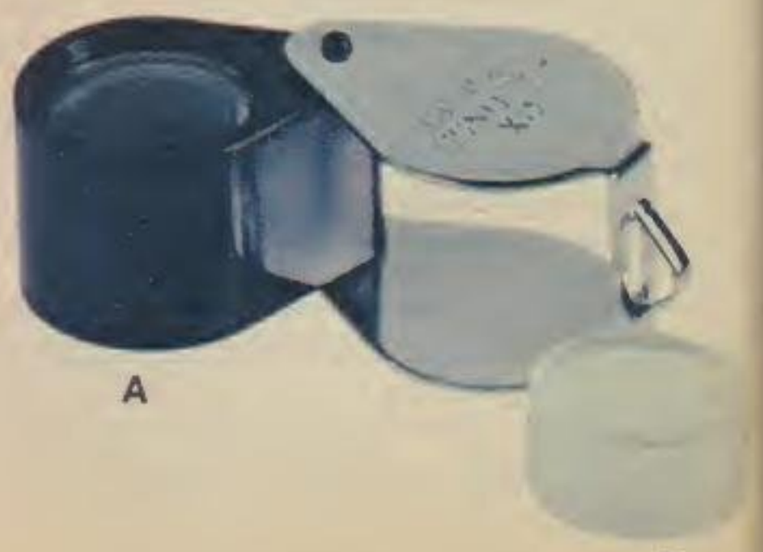
"King Of The Magnifiers"
The Hastings Triplet
Used Worldwide by Industry for Quality Control

(A) The most popular magnifier today, the Hastings Triplet is a 10 power, completely color-corrected flat field, cemented lens system. It's used by jewelers, gem collectors, engravers, machinists, printers, photofinishers, proofreaders, hobbyists, and others in a broad range of applications from flaw inspection to fine detail studies. Sturdily mounted in a black plastic cell, the lens system swings into a chrome-plated protective pocket case equipped with a chain loop. Only ¾ x 1¼" when closed, the triplet has a clear lens diameter of ½", a field of view of 9/16" & a 25 mm f.l.
No. 30,344 $18.95

(B) Unmounted Hastings Triplet.
The unmounted triplet has various OEM applications in instruments, automatic test sets, simulators, weapons, overhead doors & quality control. 19/32" (15 mm) dia. Quantity pricing available for OEM purchases.
No. 30,120 $14.95

Mounted Cooke Triplet
Actually designed as an f/3.5 projection lens, this 25 mm f.l. Cooke triplet doubles as a fine, flat field 10X magnifier. Has coated optics and is mounted in a ⅝" dia. barrel ½" long. **No. 40,524 $8.95**

WORLD'S FAVORITE!
The Hastings Triplet



A

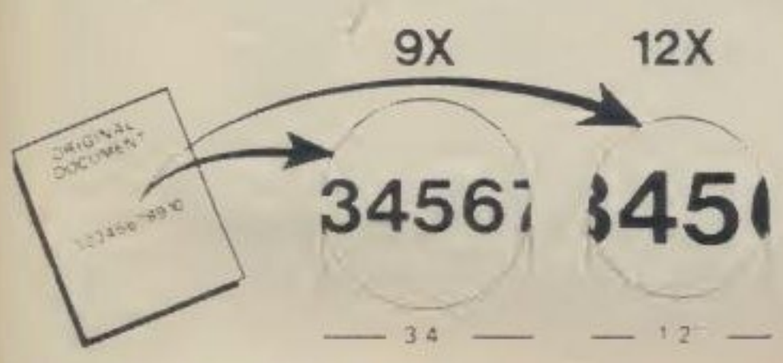
B

Pre-Cop-Tic Achromatic Magnifiers

Superior Quality As Demanded By Printers, Photographers, Artists & Editors

Pre-Cop-Tic magnifiers give large flat fields of view with crystal clear definition. They are ideal for close examination required by linotypists, finishers, proofreaders, pressman, and others in the field of graphic arts. Engineered and built to the highest optical standards, each style offers a choice of two powers—9X (¾" diameter field) and 12X (½" diameter field). The achromatic (color–corrected) three–element lens system in both models assures you of top performance. The image is clear and sharp—right to the edge of the wide flat field! The locking focus is adjustable, thus suiting individual needs. Bases are interchangeable, and the aluminum cells are anodized and dyed to resist corrosion. Protective gaskets seal both the top and bottom of each lens cell to keep the internal lens surface free of dust and moisture.

Each Pre–Cop–Tic magnifier is factory–tested and inspected and carries a full guarantee against defects in materials and workmanship.



Two Magnifications Available

All Pre–Cop–Tic achromatic magnifiers are available in two magnifications—9X and 12X—to meet the most exacting requirements. As illustrated in the diagram above, 9X magnification provides a ¾" diameter apparent field of view. 12X increases the image size by a factor of 1⅓ over the 9X, with a resultant ½" diameter apparent field of view.

(A) Transparent Base Magnifier For Editors and Proofreaders

The transparent, plastic base admits light to the subject and rests directly on work for clear, close-up examination. Excellent for determining paper quality and ink absorption.

12X	No. 30,055	$19.95
9X	No. 30,057	19.95

(B) Opaque Base Magnifier Ideal for Graphic Arts

The opaque base shuts out light and rests directly on work, making this magnifier ideal for examining negatives or for stripping work over a light table. Also very useful for focusing images on ground glass of reflex and graphic arts process cameras.

12X	No. 30,054	$22.50
9X	No. 30,056	22.50

(C) Swivel Arm Magnifier Rotates to Any Position

The most popular magnifier in the graphic arts field, this is superb for examining half-tone dots. It rotates to any position and has a stainless steel spring that prevents wobble while holding the magnifier in position. An extremely handy unit, it provides up to 1⅛" of space for working while viewing the object under magnification. Specially designed to keep lens cell off delicate surfaces.

12X	No. 30,010	$22.50
9X	No. 30,009	22.50

(D) Easy–Grip Magnifier Acid–Resistant Base

Easy to pick up, even while wearing rubber gloves, this is the perfect magnifier for etchers. It provides plenty of working distance under the lens. The clear plastic base is acid resistant and will not block light from the subject matter.

12X	No. 30,223	$24.50
9X	No. 30,224	24.50

New From Edmund Scientific

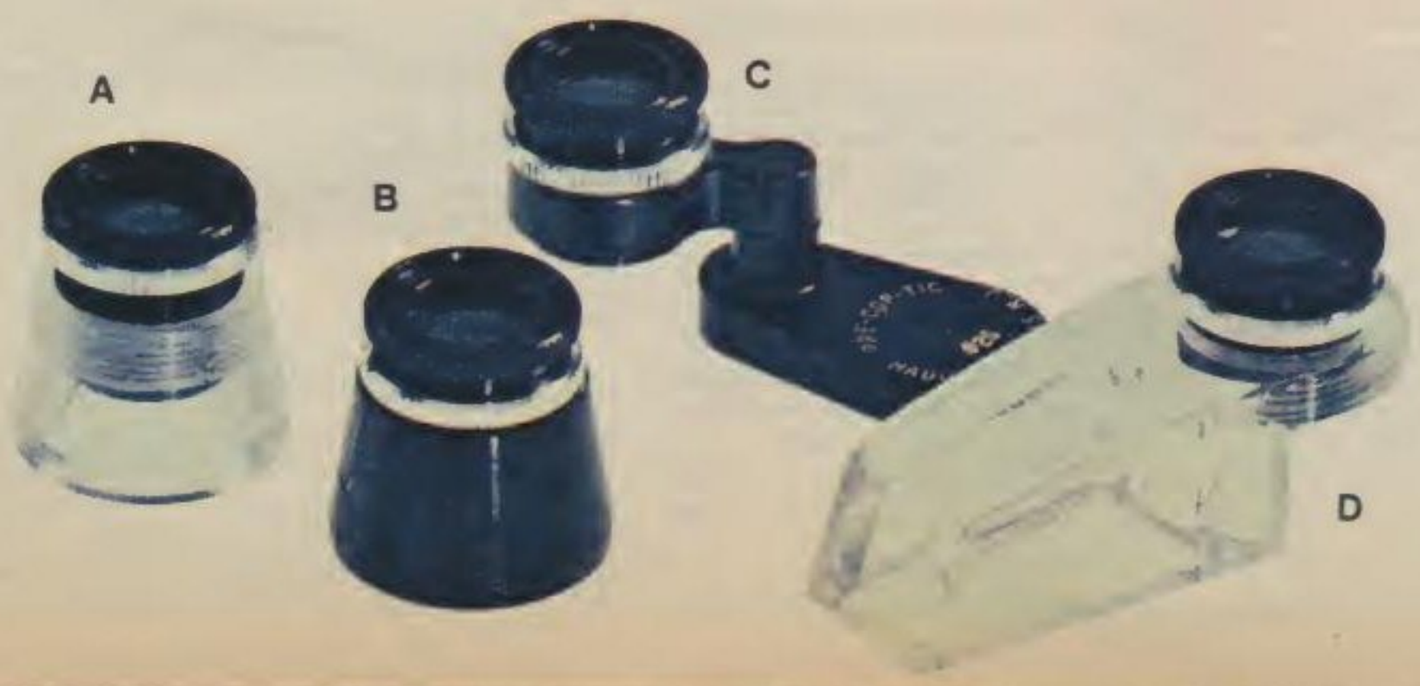
(E) At Last! A 6X Utility Magnifier Featuring That Hard-To-Find Combination of Both Wide & Flat Field

We are genuinely excited about this brand new design! It is difficult to design a wide flat field utility magnifier, but we've done it! You will constantly be amazed at the number of times you'll use this item. It's ideal for so many types of work which require fine, detailed inspection. Other features include:

- Two (2) achromatic lenses
- Rugged aluminum body construction
- Transparent, acrylic base
- Ring lock that sets focus for repeated use
- Excellent clarity & sharpness to lens edge
- 1⅛ inch diameter field of view

Need greater accuracy? We think you'll find it with this versatile magnifier!

No. 42,769 $29.50



NEW! FROM EDMUND

Magnifiers

(A) Watchmaker's Eye Loupes

1" diameter lenses with easy-to-clean black plastic mounts. Comfortable spring-steel headband with permanent spring-back is optional as listed below.

With Headband				Without Headband	
Working Distance	Approx. Power	Number	Price	Number	Price
2 in.	5X	40,146	$2.95	40,142	$1.90
2.5 in.	4X	40,147	2.95	40,143	1.90
3 in.	3¼X	40,148	2.95	40,144	1.90
4 in.	2½X	40,013	2.95	40,012	1.90

(B) Clip-On Spectacle Loupes

Suitable for precision work applications. Set in sturdy, chrome-plated mounts. Arm, holding swing-away lenses, attaches securely to either wire or plastic eyeglass frames. Lenses swing up & out of vision line.

Power	Lens Dia.	f.l.	Number	Price
Double Loupes				
3X, 5X, 8X	24, 20 mm	3½", 2"	40,513	$17.95
5X, 10X, 15X	24, 15 mm	2", 1"	40,514	17.95
Single Loupes				
2X	24 mm	5"	40,510	$14.50
4X	24 mm	2½"	40,511	14.50

(C) Clip-On Binocular Magnifiers

Lightweight for comfort (only 2 oz.) these are excellent for close working distances. Swing up or down for use and in or out for fine adjustment. Ideal for work or hobby, they fit most eyeglass frames.

Power	Work. Dist.	Number	Price
1.75X	14 in.	41,729	$14.25
2.25X	8 in.	41,730	14.25
2.75X	6 in.	41,731	14.25
3.5X	4 in.	41,732	17.00

(D) Telesight-Magnifiers

Allows magnification without loss of correction provided by your eyeglasses. A handy magnifier that reduces eye fatigue, frees hands and swings out of the way when not needed. Clamps to eyeglass frames. 1 oz.

Power	Focal Range	Number	Price
2X	10 in.	50,240	$19.95
2.5X	6⅔ in.	50,241	19.95
3X	5 in.	50,242	19.95

(E) Spectacle Loupe

Hooks over eyeglasses. Use both lenses for 11X or just swing-away front lens for 6X. Dia. of lenses: ⅞" & 9/16".

No. 30,027 $4.75

(F) Flip-Up Binocular Magnifiers

Handy & comfortable to use since they eliminate squinting & provide greater depth of field. Recessed to prevent scratching, lenses are mounted in clear lucite frame for all-around viewing. Eye shade prevents glare. Padded leatherette, adjustable headband for maximum comfort. Accessory 2.5X swing-in loupe is available for either eye. When in use, this reduces the working distance about one-half.

Power	Work. Dist.	Number	Price
1.71X	9–9½ in.	70,699	$13.50
2.5X	5–5½ in.	70,698	13.50
2.74X	3⅞–4 in.	70,697	16.50

Accessory 2.5X swing-in loupe No. 40,736 $2.95

(G) Dual Power Eye Loupe

Use it complete as shown for 7.5X magnification. Screw off front element for 4X. Lens diameter: front ¾"; back 1". Working distances: 1⅓" at 7.5X; 2½" at 4X.

Without Headband No. 40,150 $3.95
With Headband No. 40,036 4.95

(H) Mini Magnifier Lenses For Eyeglasses

Ideal for anyone doing fine detail work. Mounts directly on eyeglasses with small suction cup. Swivel-type ball joint allows lens to be moved in any direction. Set of two 14.5 mm dia. lens. Each packed in safety vial.

2.5X and 4X No. P-30,841 $7.95
1.2X and 1.6X No. P-30,842 7.95

(I) Headband Loupe Magnifier New

Hinged lens bar and lens pivot that are totally adjustable so that you can shorten or increase working distance. It has a non-reflective vinyl headband, ophthalmic quality lens, and can be worn with bifocals or trifocals. Select the power and working distance that best suits your needs.

Power	Work. Dist.	Number	Price
1.75X	14 in.	42,797	$17.50
2.25X	8 in.	42,798	17.50
2.75X	6 in.	42,799	17.50
3.5X	4 in.	42,800	21.50

Bausch & Lomb Magnifiers

(J) Adjustable Illuminating Stand Magnifier

Provides 1.3X magnification with light just where you need it and leaves both hands free to use the 4 inch working distance. The 4" x 2" lens of scratch-resistant optical glass provides a uniform, large area magnification from edge to edge. The lens and 9 watt light are adjustable. 115 V, 60 Hz. No. 61213 $16.50

(K) 12" Long Bar Magnifier With 8" Scale

The Magna Rule has an overall length of 12". It can span long lines of type and is particularly useful with tabulated data where it serves as a linear guide. Comes complete with an 8" scale and a protective case.

No. 61,214 $3.50

(L) 3" and 5" Round Magnifiers

Ideal for reading, hobbies or work. Each has a scratch-resistant optical glass lens which provides uniform, crystal clear images from edge to edge. Durable, high-impact plastic handles provide hand comfort, even after hours of use. Both have a working distance of 6¼" and are 2X.

3" Round Magnifier No. 42,716 $9.95
5" Round Magnifier No. 42,717 16.95

(M) The Magni-Viewer New

This new, around-the-neck magnifier magnifies a full book page and leaves both hands free for reading or work. Optical grade acrylic plastic combines excellent optical fidelity and lightweight comfort. Its rectangular shape provides an efficient, large area of viewing.

No. 61,241 $10.95

(N) Illuminating Reading Magnifier

Has a self–contained illumination system with a small 110 V bulb that floods the reading area with light. The unit features a heat–sensing cut–off switch; if it is left on by mistake, the unit will automatically shut off before damaging heat builds up. The 1.5X magnifier is efficiently shaped for easy holding and reading. Working distance is 5". **No. 61,215 $16.95**

(O) Packette Magnifiers **New**

These handsome, contemporary designs are slightly larger than a pack of matches. Their hard plastic covers snap open & click shut.

Power	Working Distance	Number	Price
5X	½ inch	42,772	$4.95
3X	2½ inch	42,771	3.25

Aspheric Magnifiers For Undistorted Images

Aspheric magnifiers employ special lens surfaces to provide higher magnification with less distortion. They offer true binocular vision, definition over the entire field and lightweight handling. Both the stand magnifier and the hand–held magnifier feature modern designs.

(P) Large Aspheric Stand Magnifier

Lens size is 4" x 3" (102 x 76 mm), 2.5 X

No. 42,722 $43.95

(Q) Illuminating Hand–Held Aspheric Magnifier

50 mm dia., 3.5X, battery–powered (not included). Complete with fitted instrument case & measuring disc.

No. 42,721 $28.95

Pocket Magnifiers

Folding Pocket Magnifiers

(R) 4X. 2" dia., double–convex lens in plastic frame, simulated leather case. **No. 40,024 $1.75**

(S) 3X, 6X & 9X. All 3 double–convex lenses are ⅞" in dia. Black plastic case. **No. 40,032 $5.25**

(T) 8X or 12X doublet. Greater power. Metal case.

12X 1½" dia. lens **No. 40,028 $4.95**
8X 1" dia. lens **No. 40,029 6.95**

(U) Linen & Product Tester

Features folding aluminum stand for hands–free use.

Power	Lens Dia.	Suggested Applications	Number	Price
5X	1⅛"	printing, textiles	40,649	$9.95
6X	1 1/16"	photo lab, graphics	40,030	7.95
9X	¼"	wiring, electronics	40,031	5.75

Reading Magnifiers

(V) (W) Reading Glasses

Read wide columns of small or difficult type. Long working distance, 2X, wide field of view. (V) has bifocal insert for extra magnification.

Style	Lens Dia.	Number	Price
V	3 in.	40,027	$4.95
V	4 in.	30,031	6.95
V	4½ in.	60,354	9.50
W	2x4 in.	42,579	6.95
2x4 in. unmounted lens only		42,649	2.50

Illuminating Flashlight Magnifiers

The magnifier is incorporated into a standard flashlight handle. Use it to examine textiles, signatures, auto parts, maps or drills, even for photo retouching.

(X) Enlarges finest print, built on 45° angle for clear viewing without bending over. 3⅞" x 2" lens, 1.5X

No. 42,578 $12.95

(Y) Has 2 plano–convex lenses for flat wide field. Engraved inch & mm scales. 3⅝" case. 5X, 50 mm dia. lenses. **No. 50,154 $12.95**

(Z) A Large Field Illuminating Magnifier With Great Definition

Enjoy hands–free viewing with this water–clear illuminating magnifier. Ideal for viewing small print. It's great for reading maps in the car because it has its own light. Useful for studying coins & stamps as well. 3½" x 3" lens, momentary & fixed on/off switch, heavy–duty plastic case. 2 "C" batteries included.

No. 42,412 $13.50

(AA) Low Cost Illuminating 30X Magnifier

Provides a sharp, bright vision with a wide field of view. Designed for close observation of minute details too small to be seen by the naked eye. The built–in illumination & focus system offer added convenience and in–use comfort. Only 1⅛ x ⅝ x 4¾". 2 "AA" batteries included. Inverted image. **No. 61,083 $21.95**

(BB) Illuminating Magnifier Lamp

Designed for precision inspection, optical manufacturing, assembly, tool making, lab work, drafting, photo–retouching, jewelry repair & the like. Offers two–hand working freedom & a 5" lens. 22 W circline fluorescent tube illuminates work area from all sides for shadow–free, balanced light. Bracket attaches to work table, permitting 360° rotation of the lens. Features adjustable tension control knob, heavy–duty aluminum shade, fingertip control on/off switch, low–friction precision joints, grounded cord w/molded plug, 30" extension reach, 5" dia. 3 diopter lens, baked enamel finish. 3–4X magnification. Perfectly balanced in any position. An excellent instrument! **No. 83,019 $119.95**

(CC) Industrial Illuminating Magnifier

Ideal for inspection or assembly operation. Arm extends to 12", lens tilts back for use as a lamp. This lamp/magnifier is compact, lightweight & multi–functional. Hang, stand or mount it anywhere you need it. Input voltage is 115 V AC; built–in transformer provides low voltage power to the included #1133 bulb. Power consumption is 25 W. 2X magnification, 4½" dia. glass lens, hi–lo switch & all metal construction.

No. 72,430 $56.95

Self–Standing Magnifiers

(DD) Gooseneck Magnifier For Inspection

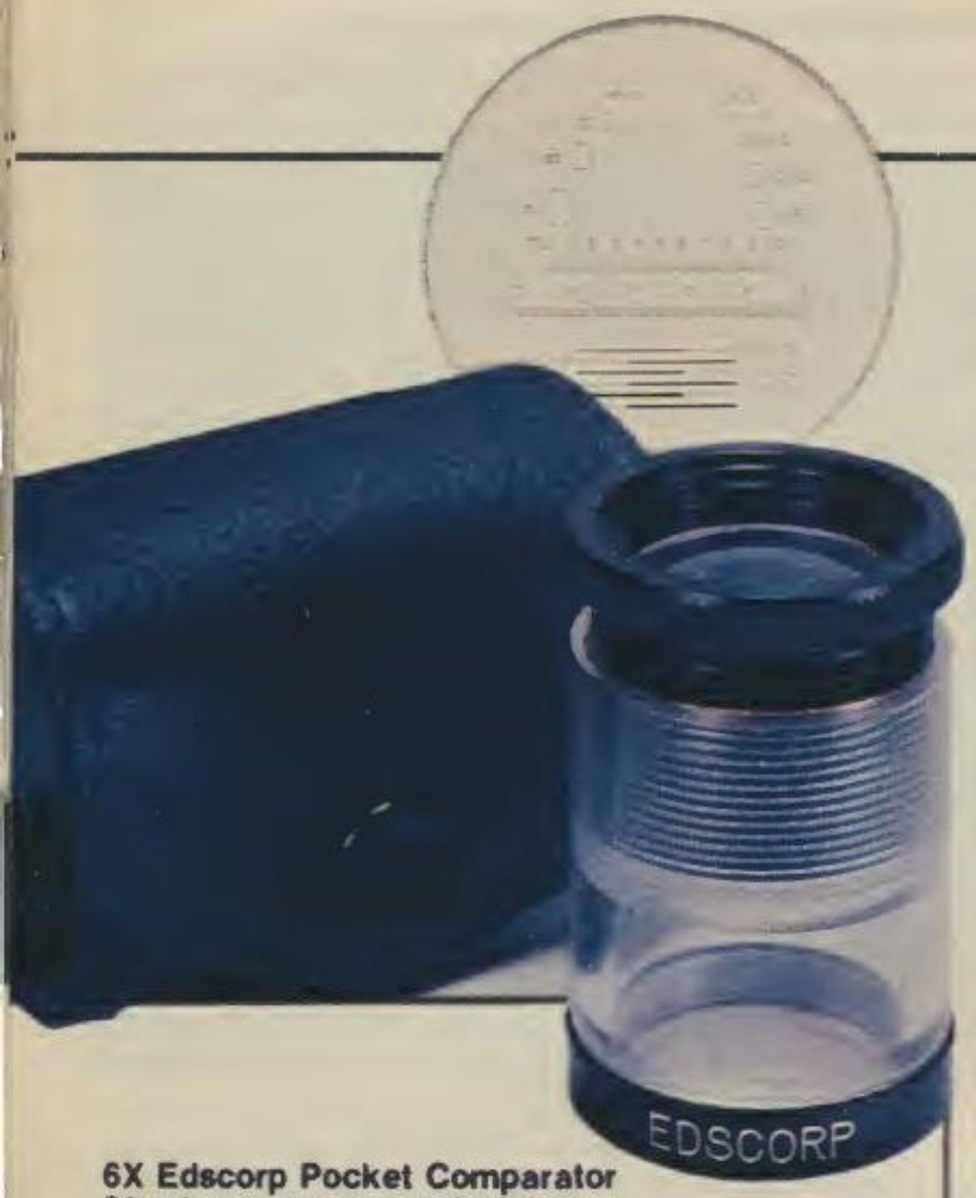
Low power (approx. 2X) for wide field and longer working distance. Large 4" dia. glass lens in chrome–plated brass mount is attached to 12" long flexible gooseneck. Ball swivel joint provides movement in any direction. Weighted metal base. **No. 70,241 $19.95**

(EE) Swivel Clamp 2X Magnifier

4" dia., 8" f.l. lens gives wide field of view & ample working area. Screw clamp with 5/16" clearance attaches to light fixtures. Double–ball joints adjust to any position.

No. 30,249 $10.95

Magnifiers



6X Edscorp Pocket Comparator
***3–element cemented triplet**
***Unusually flat field**
***Positive focusing**
***Leather pocket case**

The Edmund Scientific Pocket Comparator has hundreds of applications in industry, the laboratory and at the workbench. Instantly ready for use, it requires no time–consuming adjustments. Ideal for checking small parts, linear measurements, angles, hole diameters, thread sizes, etc. Reticles are available for geological sand measuring, meterology, aerial photography and other specialty fields.

Unlike lower priced comparators that have only a simple lens, the 6X comparator incorporates a triplet lens. It provides an extremely flat field over the entire reticle area to insure accurate measurements. Light is admitted through the clear plastic cell–walls (in dark areas use our No. 50,076 illuminator on page 49). Pocket size, 2" high x 1¼" dia., it's handy for on–the–job applications. Accepts all of the 27 mm dia. etched, glass reticles, individually described on this and the next page.

Comparator Magnifier with Case (reticle not included)
No. 30,325 $34.95

Above Comparator Magnifier, complete with Reticle (No. 30,585), leather case. **No. 41,055 $44.95**

27 mm Dia. Reticle. Three horizontal scales: 20 mm zero center scale (10–0–10) with both sides calibrated 0 to 1 in 0.05 mm, 1 to 5 mm in 0.1 mm and 5 to 10 mm in 0.5 mm; 0.5" scale with 0.005" div., and a ⅛" scale with 1/64" divisions. 90° angle scale in 5° divisions (0 to 80); and 1° divisions (80 to 90). Ten circles with diameters from 0.1 to 1.0 mm and 10 w/decimal and fractional inch diameters from 0.005" to 1/16". Angle scales 29°, 55°, 60°, & 118°. **No. 30,585 $13.50**

Reticles

Reticles (27 mm dia.) . . . . . $12.95 Each 27 mm diameter, etched–glass reticles; pigment filled, won't warp. Valuable for industrial measurements or for use with 6X and 12X comparators.

(A) Reticle No. 30,584: 0.3" x 0.4" grid in 0.025" squares. Two horizontal scales: 4" with 0.005" divisions, and 20 mm (10–0–10) with 1/10 mm divisions. Angle scale 0° to 90° in 1° divisions. Radius scale 1 to 10 mm in ½ mm divisions. Nine circles 1/10 mm to 3 mm dia.

(B) Reticle No. 30,323: 20 mm scale in 200 parts. Graduated every 0.1 mm; numbered every 1 mm.

(C) Reticle No. 30,587: fifteen line widths in increments from 0.002 to 0.016".

Reticle No. 30,586: 13 line widths (mm) 0.04, 0.05, 0.06, 0.07, 0.08, 0.09, 0.1, 0.15, 0.2, 0.25, 0.3, 0.35, 0.4 mm.

(D) Reticle No. 30,589: 10 mm radius scale numbered each mm, graduated each ½ mm, 180° protractor numbered each 10°, graduated each degree.

(E) Reticle No. 30,588: 10 mm square divided into ½ mm squares. 10 mm scale in 100 parts. 13 circles, 0.1 mm to 2.5 mm.

(F) Reticle No. 30,591: 9 (inch) screw threads shown in TPI, 50, 32, 28, 20, 24, 18, 16, 14, 8.

(G) Reticle No. 30,590: 9 metric screw threads, 0.25, 0.3, 0.35, 0.4, 0.45, 0.6, 0.75, 0.9, 1.00 mm.

(H) Reticle No. 30,174: Geological Sand 10 mm grid scale numbered every mm with 2 mm grid ruled in 0.2 mm squares, includes 1/16, ⅛, ¼, ½, 1, 2, and 4 mm circles for grain size measurements.

(I) Reticle No. 30,461: Aerial Photography. 20 mm scale graduated each 1/10 mm, numbered 0 to 20. Scale 0.07 ft. long, graduated every 0.0005 ft. numbered every 0.005 ft. Compass rose calibrated each 5°, 0°, to 180° left to right and right to left.

OCR Reticles: Etched with transparent red ink on glass discs for quick OCR "go," "no go" tests. Character outline block indicates max. & min. tolerances for outer and inner stroke borders of characters.

(J) Size I Reticle **No. 30,642 $14.50**
Size IV Reticle **No. 30,643 $14.50**

X Graphic Arts Comparator
or Type, Spacing, Screens
)ne linear scale measures to 48 points by ½ point increments. Another, ½ inch long, has 1/100 inch and 1/200 inch divisions. 12 scales measure halftones from 50 to 200 lpi. Also ¼, ½, 1, 1½, 2, 3, 5 and 6–point blanks. Etched and filled glass reticle, 27 mm dia. Clear plastic body, single element lens, focusing threads with lock.

1¾" high	**No. 30,551**	**$24.50**
Reticle only.	**No. 30,539**	**$13.50**

12X Magnetic Ink Comparator With Revised E–13 B2 Reticle
Compare Checks Against American Banking Association Tolerances
n today's technological world, the use of computers in industry is becoming commonplace. Because of their increased use in the field of banking, the use of magnetic ink printing is becoming more and more important. The 12X Magnetic Ink Comparator is an invaluable tool in this field. Every bank check printer or magnetic code user will find his instrument ideal for "go," "no–go" measurements. Its small size, 1⅝" high x 1¼" diameter, makes it convenient to carry.

Reticle enables user to check character skew, width, coverage, voids and other characteristics against American Banking Association tolerances.

No. 30,285 $29.50

12X Magnifier With 21 mm Diameter Reticle Adapter: Receives reticle 30,186 shown at right. **No. 30,178 $18.95**

Reticle only	**No. 30,284**	**$13.50**
12X Magnifier with 27 mm Reticle Adapter.	**No. 30,177**	**$22.50**

Note: When using 27 mm diameter reticles with comparator No. 30,177, only center portion of field (13 mm diameter) is visible, due to higher magnification.

(K) Illuminating Coddington Magnifiers. **"New"**
The Coddington Magnifiers stand next to the Hastings Triplet in performance! A single, thick lens with central groove diaphragm produces a crisp image. The Coddington's also feature durable, high–impact plastic lens mount and swing–away metal case. A self–contained, battery–powered light source projects light directly onto the area being examined. Combining high power and bright illumination, the Coddington Magnifiers are sound economy for users who don't require the precision of the Hastings Triplet.

5X	**No. 42,773**	**$15.95**
10X	**No. 42,812**	**15.95**

(L) Comparator Illuminator
***Battery Operated**
Use this Comparator Illuminator inside machinery, and other dark areas. 7½ inch battery–operated light illuminates both the reticle and work. Accepts pocket comparators from ⅞ inches to 1 7/16 inches O.D. Chrome finish; uses 2 "AA" batteries (not included).

No. 50,076 $24.95

6X Junior Size Comparator
***Measures to 0.005"**
***Etched Glass Reticle**
***Leather Case**
Full 6–Power Magnification!
The Edmund Scientific Junior Comparator is easy to carry in your pocket or tool chest—it's only 1¾" high x 1" O.D. It has an etched glass reticle instead of a film reticle found on many other pocket comparators. This insures stability, since glass will not bend or warp and is not damaged by oils or solvents. The pattern is filled with pigment, making it easy to read under magnification.

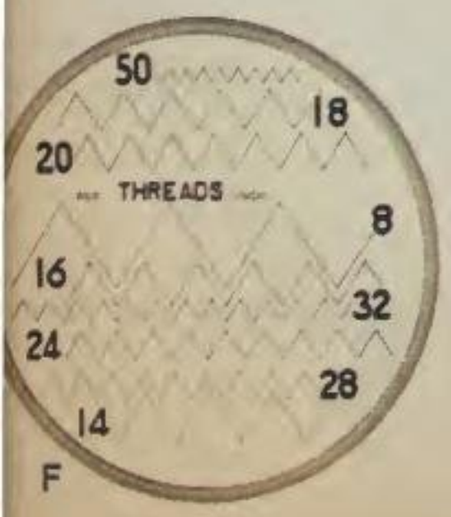
A special feature of the reticle is the thickness comparison scale (E). A series of parallel lines 0.002" to 0.007" apart make it possible to measure the thickness of materials like paper, plastic, gaps between mechanical parts—as well as line widths—visually and directly. This is an advantage, since mechanical measurements of such items are sometimes inaccurate because these materials are apt to compress.

Linear scales are provided both in millimeters (B) and in decimal inches (C). The 10 mm long metric scale is divided into units of 0.005 inches. The scales for comparing hole diameters read in fractions from 1/64" to 1/16" (A), and in decimals from 0.005 inches to 0.050 inches (D).

The reticle and the object to be measured are both magnified 6X. The optical lens system is free of distortion right to the edge of the field. Cell of transparent lucite admits plenty of light to reticle and work. Illuminator No. 50,076 (left) can also be used with it. The magnifier can be focused & locked to suit individual users. Complete with genuine leather case & instructions: **No. 30,169 $31.95**

Reticle Only. As described and illustrated above. 21 mm diameter. **No. 30,186 $12.50**

Highest Quality . . . Best Values!



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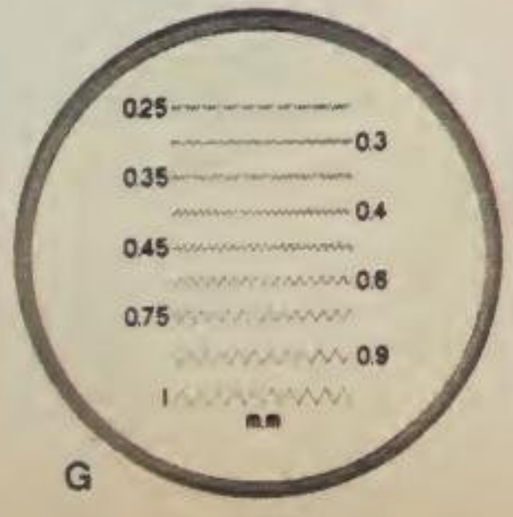

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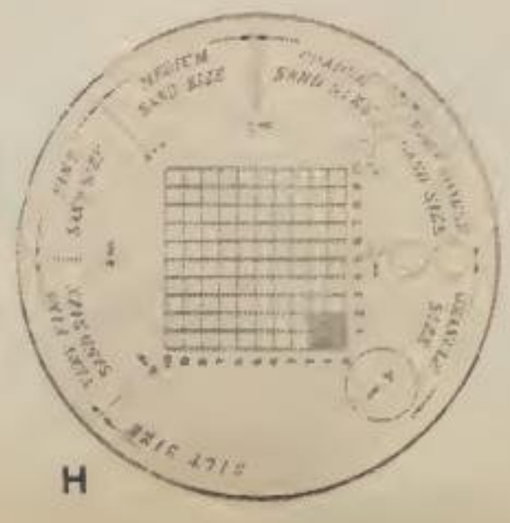
H

I

J

Biofeedback *Monitor Your "Inner Energy"*

- **Listen To Your Brain**
- **Discover Your Inner Consciousness**
- **Monitor Activity Below Levels of Normal Awareness**

Today's world greets mankind with a barage of environmental stimuli. It's a fast-paced maze of events with the constant demand that we respond or adapt in some way. We do, indeed, react . . . unfortunately, our responses often are not the most physiologically desirable ones! Moreover, our constant adaptation causes us to lose touch with our inner selves. We become smothered in environmental static which diminishes our sensitivity, awareness and potential.

Biofeedback allows us to gain an immediate and objective means of reflecting our internal indicators of state, such as brainwaves, muscle activity and temperature. By monitoring these "inner energy" signals, we can once again become more sensitive to ourselves.

Consider yourself for a moment. In what ways is your body reacting to the environment? How do you react to stress? Are you **really** relaxed? Why do Zen & Yoga meditators seem to emit higher concentrations of "alpha" brainwaves? We invite you to monitor your release of "inner energy"—you may be surprised at what you find.

Biofeedback techniques, when used in a clinical setting under the guidance of a biofeedback professional, can be useful as a therapeutic tool to deal with hypertension, muscular rehabilitation, stress and other disorders. Some scientists believe that, by monitoring internal signals, we can become aware of inappropriate responses and learn to control body functions and problems. Research is currently being conducted on at least four basic types of biofeedback: brain wave (EEG), muscle activity (EMG), galvanic skin response (GSR) and temperature (i.e., blood flow).

Our biofeedback instruments are completely safe. They allow you to monitor conditions associated with relaxation, stress, creativity and emotion. By translating your body's internal activity into readily observable signals, usually an audible tone or flashing light, these instruments will enable you to explore this fascinating and expanding science.

(A) Listen To Your Body Relax With The Myosone Muscle Monitor

Monitoring key muscle areas is the latest development in the growing field of biofeedback techniques. The Myosone's integrated circuitry provides accurate & reliable discrimination of minute muscular signals & potentials. Suitable for clinical as well as home use, it may be used to monitor tension headaches, backaches & other anxiety-related muscular activity far below normal levels of awareness. A wide dynamic range (1 to 500 uV), proportional EMG and threshold audio feedback modes provide accuracy & flexibility for reliable muscle discrimination. The Myosone features a switch-selectable 60 Hz line reject filter, calibrated meter in 4 ranges (0–10, 0–50, 0–100, 0–500 uV), calibrated sensitivity & threshold controls, 18 db/oct. filter, built-in test signal, earphone jack, electrodes, outputs for coupling & further monitoring capability. Uses two 9 V batteries (not incl.). The perfect companion instrument for Biosone III! 9¼ x 5⅝ x 4¼". **No. 1680 $224.95**

Caution: If AC powered recording devices are used, the Safety Interface Coupler (No. 42,416) below is required for user safety.

(B) Safety Interface Biofeedback Coupler Eliminates Shock Hazards

2 channel coupler specifically designed to interface biofeedback instruments (No. 1680 & 1668, pg. 50) with outside recording devices such as strip chart recorders, oscilloscopes, etc. Optical isolation insures no direct AC connection to the subject. Channel 1 provides linear coupling from 0.5 Hz to 1 KHz (±3 V max.). Channel 2 couples logic signals (compatible w/TTL & CMOS logic). 4 x 5 x 1¾". **No. 42,416 $72.95**

(C) Biofeedback Percentage Time Monitor

This is an accessory instrument only; it cannot be used alone. It requires a biofeedback instrument (e.g., Biosone II or Myosone) to generate a logic signal output. 2 modes automatically calculate & display percent of time a given variable exceeds a preselected threshold over time period (8 sec.–30 min.). Provides an ongoing cumulative readout of percent of time subject produces specific response. Threshold control setting 0–100%, hi/lo logic signals from 0–5 V nominal (10 V max.). 8 bit time resolution (0.4%). 9 V batt. (not incl.)

No. 1686 $179.95

(D) The Biosone II Professional Quality Alpha/Theta Monitor

The Biosone II is designed for professional clinical use as well as for advanced home study. Similar to an electroencephalograph (EEG), it is a biofeedback sensor that lets you identify the electrochemical activity within your brain. In doing so, for example, you are able to correlate brainwave states with feelings of relaxation and creativity.

Conveniently portable, the Biosone II is engineered for simplicity of operation. It features a switch-selectable alpha/theta filter, internal self-test generator, calibrated sensitivity control (5 to 100 uV), 2 audio feedback modes (frequency modulated tone & threshold tone) and an LED that glows when the signal level rises above

How Do You React To Stress? Are You Really Relaxed?

threshold sensitivity level. It also includes an earphone jack for private use and outputs for external recording or monitoring of unfiltered & filtered EEG signals. Housed in a simulated walnut case, it comes complete with instructions, input electrodes & electrode cream. Uses two 9 V batteries (not incl.). 9½ x 5⅜ x 4¼".

No. 1668 $169.95

(E) Biosone I Portable Alpha/Theta Monitor

The Biosone I represents a price breakthrough in this developing science. It's a complete, portable instrument with accessories that produces a variable frequency tone indicating type of brainwave produced. Includes a sensitivity & volume control, switch-selectable filter, low noise amplifier w/5 uV sensitivity & rejection of distracting eye-blink interference, earphone, headband w/electrodes, neckstrap, electrode cream, aluminum case & instructions. Uses 9 V batt. (not incl.)

No. 71,809 $69.95

(F) Build Your Own Alpha Monitor For Only $39.95

If you have a basic knowledge of electronics & enjoy building kits, this sensitive, solid-state unit is for you! Designed for the biofeedback beginner, kit includes stethoscopic earphones, electrode headband, solid-state IC circuitry (5 mV sensitivity), narrow band pass filters, high gain/low noise amplifier (eliminates eye-blink interference), instructions & operator's manual. Uses 9 V batt. (not incl.). Finished size: 5½ x 2¾ x 1⅛".

No. 61,069 $39.95

(G) LD—101 Light Bar Display

Adds an additional visual feedback modality to the Myosone and Biosone II and provides a quantitative measure of physiologic activity in bar graph form. Two separate readouts are possible: a 10 segment LED displays proportional activity, while two LEDs indicate threshold goals. This battery-operated accessory may be used at a location remote to the biofeedback instrument, allowing the operator to vary instrument controls.

No. 61,248 $84.95

(H) Test Yourself With Our New GSR Monitor

- **Used Widely by Biofeedback Clinicians & Psychologists**
- **Measures Skin Resistance & Skin Temperature**

The GSR Monitor features precise solid-state sensitivity which meets laboratory standards. It provides both audio & visual feedback with a wide range of sensitivity. It includes velcro fastener finger electrodes for skin resistance & thermistor electrodes for skin temperature biofeedback. Use it as an emotion meter, relaxation meter, plant response meter or as a sensitivity training aid. The GSR Monitor registers ±1% skin resistance change & skin temperature changes of ±0.2°F. Controls include: a variable sensitivity, null balance, polarity reversal & self-test. 3" meter, tape recorder jack, terminals for oscilloscopes & strip chart recorder, earphone, electrodes, electrode cream & instructions. 9½ x 5⅜ x 4¼". Uses 9 V batt. (not incl.)

No. 72,415 $159.95

The Executive GSR Monitor

The Executive Galvanic Skin Response Monitor is an attractive, effective, yet inexpensive instrument for people seeking to learn more about tension reduction techniques. It is conveniently pocket-sized (4 x 2¼ x 1") with solid-state electronics. The skin resistance range is 5K ohm to 2M ohm; skin resistance change indicates 40% of initial resistance; sensitivity, 3% of initial resistance. Includes 9 V battery, cassette training tape, GSR & stress plus user exercises & 10 pg. manual.

No. 42,393 $69.95

(I) GSR Meter . . . An ESC Surplus Value!

The Galvanic Skin Resistance Meter is a transistorized electronic device that monitors changes in body resistance by using 2 sensitive sensors. Intended for entertainment purposes, it's a simple, inexpensive monitor (it is not a polygraph). Discover hidden numbers . . . play amateur detective games . . . become aware of your emotions!

No. 72,457 $10.95

(J) GSR/Temp 2 Biofeedback Relaxation System

- **Helps You Monitor Stress & Strain**

This galvanic skin response & temperature monitor uses solid-state electronics to detect & amplify internal body activities that change with your state of mind, muscle tension & emotional level. System includes thermistor (remote control temp.), thermometer for starting temp., elastic strap to keep hand in constant contact with unit, 20 minute cassette, earphone, battery, instruction manual & high impact case.

No. 42,637 $89.95

(K) Success Cassettes

Loaded with proven ideas for success in management and personal development!

Psycho-Cybernetics by Maxwell Maltz, M.D. The power of self-image psychology. **No. 42,484 $9.95**

I'm OK—You're OK by Thomas A. Harris, M.D. Understand yourself better & enjoy vastly improved relationship with others. **No. 42,485 $9.95**

Memory Magic by William Hayes. Make your memory an obedient servant. **No. 42,486 $9.95**

(L) Dr. Barbara B. Brown On Biofeedback

"New Mind, New Body"—Barbara Brown's Classic! This 478 page hardcover book is often referred to as the "Bible of Biofeedback". Dr. Brown is the physiologist-psychologist-pharmacologist who coined the term "biofeedback". **No. 9525 $12.50**

"Stress And The Art Of Biofeedback". Dr. Brown's new book is the first comprehensive formulation of how to use biofeedback to treat a variety of illnesses, especially those related to stress. 300 pg. of documented research. **No. 9547 $12.50**

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Large telescopes will be shipped Transportation Charges Collect

TOTAL	$	
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When ordering directly from the U.S.A., we request that your order be written in English.

International Prices: Our catalog lists U.S. prices, Net F.O.B. Barrington, N.J. Because of customers, duty, etc. prices of our overseas distributors may be somewhat higher. Use the order blank included with this catalog. If none is included, request one from your local distributor or from Edmund's International Department. Export declarations and consular documentation are additional. If desired, a complete Cost & Freight Proforma invoice will be submitted upon request.

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Visit Edmund's Unique Factory Store and FREE Light Show!

- **We're located in Barrington, N.J., a short drive from Atlantic City, N.J. and just minutes from Camden, N.J., Philadelphia, Pa.**
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CLOSED: Easter Sunday, Memorial Day, Independence Day, Thanksgiving, Labor Day, Christmas Day and New Year's Day.

All items appearing in this catalog may be seen at our factory store on the Gloucester Pike in Barrington, N.J. We have included a map for your convenience. Close to many major points, our store is easy to find and easy to get to (convenient to major highways). Many new and unusual unique, hard-to-find items arrive every day. Shop for special buys throughout the store...hunt through our Surplus Department for one-of-a-kind and discontinued products. Your visit will be an exciting and fascinating experiece. Try out a metal detector in our 'testing' sand pit. Look through our submarine periscope and scout the surrounding area. Push a button and light up a blacklight display in our eerie Blacklight Hallway. Walk through our mind-boggling Hall of Mirrors. Marvel at our FREE Multi-media Light Show featuring a 96ft. curved "involvement" screen that goes beyond your peripheral vision, exposing you to psychedelic impressions similar to those shown on our Unique 'Lighting pages. Come to Edmund's Factory Store. . .we're waiting to show you around.

Six New and Exciting Product & Gift Ideas from Edmund Scientific!

A

A. The Bearcat™ Warning Radio. . .Be Prepared for Weather Emergencies

Activated by a signal from the National Weather station, the Bearcat™ weather alert turns on automatically and broadcasts the emergency warning loud and clear. And in case you miss the broadcast, an 'ALERT' warning signal flashes to let you know that an emergency broadcast had been issued in your absense. In daily use, the Bearcat™ Warning Radio broadcasts the latest weather report in your area at the touch of a finger. In case of power failure, Bearcat™ also works on batteries. A must in areas where severe weather may be a danger to life and property. **No. 61,255** **$89.95**

C

B

B. Refractor Telescope Kit with 20X, 25X, 30X, & 40mm Magnification

Now you can learn to build your own telescope and learn the principles of refractor telescopes at the same time. This complete kit shows you how to build a refractor telescope with 20X, 25X, 30X or 40mm magnification. Kit includes all the components necessary to build a 'scope with any of these magnifications while you learn the construction of a refractor. And later, enjoy the pleasure of your own ingenuity and handywork as you gaze star-ward or seek out the beauty of nature's faraway secrets. **No. 61,256** **$49.95**

D

C. The Mysterious Magic Fountain

An intriguing, desk-top thought provoker, this handsome clear acrylic cylinder spurts a blue jet fountain. . .but how does it do it? Completely self-contained, the magic fountain operates mysteriously without any moving parts. . .no batteries, no motors, no pumps. This unique conversation piece makes a great gift! **No. 61,246** **$22.95**

E

D. Enhance Your FM-Radio Listening Pleasure with the Beam Box™ Antenna

A precision electronic product that can improve many of the performance characteristics of your tuner or receiver, the Beam Box™ is designed to replace ineffective indoor FM antennas such as twin-lead dipole wires or "rabbit ears." Highly directional, it picks up desired signals while rejecting undesired signal reflections that cause multi-path distortion and background noise. Take this important step toward realizing the full quality of your sound equipment. **No. 80,296** **$49.95**

E. The Astronomical Calendar

The perfect holiday gift for anyone interested in astronomy. Co-sponsored by the Furman University Department of Physics and the Astronomical League, the Astronomical Calendar helps the amateur astronomer learn the basics of astronomy and gives a full description of astronomical events for the year, including sky maps for each month and solar system diagrams. Complete explanation of how to read maps included. Current year calendar. **No. 9584** **$8.00**

F

F. The Amazing Bubble Window

Nineteen miniature, wide-angle lenses form an intriguing circle that gives you a fly's eye view when you look through it. Made of transparent plastic, the bubble adheres to glass without adhesives. Miniature lenses can be detached. A beautiful decorator item, the bubble window comes in handy on sliding glass doors as attention grabbers. **No. 72,495** **$5.95**

We're Here To Make it Easy. . .

As we enter the approaching new decade, Edmund Scientific can look back at a long and proud history—38 years of service to hobbyists, serious amateurs, and professionals. Our customers come to us from all walks of life; looking for unique, hard-to-find science-related products. Our product line is made up of over 4,000 such products, including many quality products manufactured by Edmund. This is part of what makes Edmund a very unusual place to shop. But beyond our vast product line is something else very unusual.

Backing up every product we offer is a family of employees dedicated to helping you find what you need, guiding you towards proper selection to fit your needs, providing you with prompt attention and accurate order processing, and backing every product you purchase with the famous Edmund guarantee of quality!

Many of our customers will undoubtedly spot some old friends in our "family portrait." If you've visited our Factory Store, you'll surely remember the smiling faces of the members of our retail staff. Perhaps a member of the National Sales Department helped you put together a package of industrial components that was just the right combination of quality, quantity and price. Maybe you just got off the phone with our order processing department with that RUSH order for Edmund Jumping Discs. And didn't our Technical Service Department customize a special purchase of beginner's telescope kits at a price your school couldn't resist? We could go on and on, but Edmund is a big family.

To our regular customers we just wanted to say "hello, again." To our new and future customers we'd like to extend an invitation. . .drop us a line; give us a call; come in for a visit. . .***we'd like to get acquainted!***

We'd like to get acquainted!

Photographs by Robert M. Edmund

Edmund Scientific Co.

50-E

A Note From

ROBERT M. EDMUND

President

Here's the Catalog you've been waiting for!

Our new Catalog reflects a 38 year commitment to serving customers with the finest, highest quality, unique, hard-to-find, science related products for consumers, hobbyists, education, industry and science enthusiasts--both professional and amateur.

Now, as we enter a brand new decade, we at Edmund Scientific are affirming our commitment to our customers and the future. The 1980 Edmund Catalog represents a change,for you and for us.

Always endeavoring to serve our customers with the latest, most up-to-date innovations in technology, Edmund Scientific is equally committed to experimenting with, and using where applicable, the latest technological advances, as well. Our new Catalog is representative of this philosophy. Our new Catalog size, many more pages of full color for you, newly arranged presentations to make finding what you need a little easier, and two pre-addressed order forms for your convenience are the result of the latest in printing and addressing technology!

The Edmund Catalog contains over 4,000 products to choose from . . . many are brand new. I'm confident you'll discover just what you want.

Thank You.

R. M. Edmund

PRESIDENT

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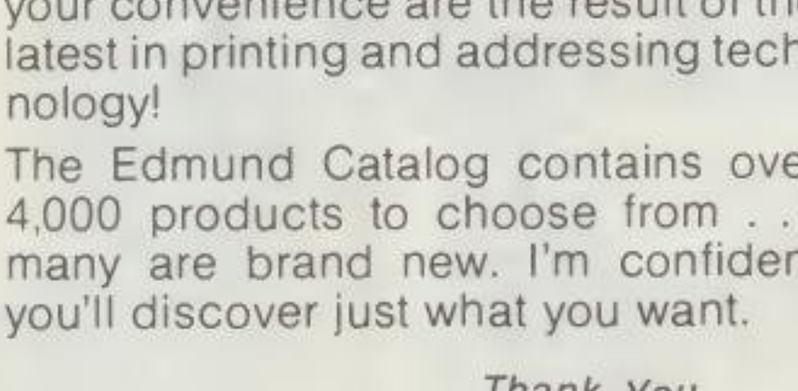

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50-B

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WE CARE ABOUT YOU! That's why we occasionally make our mailing lists available to carefully selected companies whose products and services we feel may interest you. We critically screen every company who wants to use our mailing lists so that we can limit the mail you receive to only those products we think you will enjoy. This is one way to provide a service to you . . . our valued customers. **You have a choice** . . . if for any reason you do NOT wish to receive mailings from these companies, please copy your mailing label exactly and send it to:

Edmund Scientific Co.
101 E. Gloucester Pike
Barrington, N.J. 08007
Attn: Mail Preference Supervisor

We will be sure that your name will not be made available to other companies. We will, of course, continue sending you our own FREE catalogs and special mailings.

SATISFACTION GUARANTEED OR YOUR MONEY BACK.

Edmund Scientific Co. Limited Warranty

Satisfied customers have built our business. That's why we want you to be completely satisfied with every product we sell. We never knowingly misrepresent our merchandise nor the claims of our suppliers. And to assure your continuing faith in our integrity, we offer you the following Limited Warranty: **If you are not completely satisfied, for whatever the reason, with anything you buy from Edmund Scientific Co., return the merchandise in its original container and condition prepaid with your sales receipt and all papers in the packaging within 30 days from date of purchase, and we will gladly refund your full purchase price. Returns should be sent to the attention of the Returned Goods Department. The warranty gives you specific legal rights and you may also have other rights which vary from state to state.**

NEW!

LIMITED ONE YEAR TELESCOPE WARRANTY

Edmund Scientific Co. warrants to the original retail purchaser that each telescope manufactured by Edmund Scientific Co. is and will be free from defects in materials and workmanship for a period of one year from the date of purchase. During the warranty period, Edmund Scientific Co. will repair or replace at its option any such defective telescope or part thereof at no cost to the purchaser for parts or labor.

Should any defect occur within the warranty period, purchaser must promptly return the product prepaid together with proof of purchase to Edmund Scientific Co. or to the retail establishment where purchased.

This warranty shall not apply if it is shown that the defect or malfunction was caused by abuse, mishandling or unauthorized repair.

This warranty gives you specific legal rights and you may have other rights which vary from state to state. If you have any questions concerning this warranty, please write to our Warranty Information Department.

HOW TO GET WARRANTY INFORMATION: The products of certain manufacturers as specified in this catalog have additional warranties for specific time periods beyond that of the Edmund 30-day Limited Warranty. Usually this warranty is included with the product. If you want a copy of any manufacturer's warranty (based upon availability from the manufacturer) prior to your purchase, it may be obtained at no charge by writing to: Edmund Scientific Co., Warranty Information Dept., Edscorp Bldg., Barrington, N.J. 08007. Your request should include the item stock number, description, and page number in this catalog. Sorry, we cannot accept phone requests for warranty information.

HOW TO ORDER

Three Easy Ways To Shop From The Edmund Catalog

SHOP BY MAIL **Be sure to use the Edmund Order Blank, when you have one,** and fill it out completely. Specify quantity, stock no., page no., description and unit price for each item. If package quantity, please indicate PKG and no. of packages in quantity column. Please print your name and street address. To avoid mailing list duplication always use the same name and initials on all orders. Use zip codes–yours and ours (08007) to speed delivery of your order. See page 50-D for international ordering information. NOTE: Do not request Product Information on your order form. This only delays your order.

SHOP BY PHONE **24-HOUR PHONE SERVICE for Mastercharge, VISA & American Express cardholders:**

DIRECT LINE TO ORDER DEPARTMENT . . . (609) 547-8900

BUSINESS HOURS, 8am to 5pm EST/EDT, MONDAY THRU FRIDAY.

AFTER 5pm, WEEKDAYS AND HOLIDAYS . . . (609) 547-0018

When you call this number, your order will be recorded. Please have all your ordering information ready before you call (same information as is required for shopping by mail). Be sure to give us your telephone no. so if there are any questions, we can get back to you. There is a $15.00 minimum on charge card orders.

Our Telex is open 24-Hours,too. The number is 831-564.

Product Information If you require additional information not stated in the catalog, please call our Main Switchboard, weekdays, 8am to 4:30pm EST/EDT: **(609) 547-3488.**

Adjustments & Delivery Information For Adjustments & Delivery Information, ask for our **CUSTOMER SERVICE DEPARTMENT.**
For Product Information & Technical Assistance, as for our **CUSTOMER SERVICE DEPARTMENT.**
For questions regarding Open Billing, ask for **ACCOUNTS RECEIVABLE.**

SHOP IN PERSON **Our factory store is located in Barrington, N.J**(See page 50-D for more information) near Philadelphia, Pa. and Atlantic City, N.J. Come in and visit us. All items in this catalog, plus more, are on display.

CREDIT CARDS **We accept Mastercharge, VISA (BankAmericard) and American Express.** Charge card purchases are shipped to the cardholder only. There is a $15.00 minimum on charge card orders. On all charge orders please be sure to state your card number, expiration date, and interbank number (Mastercharge only). Your signature is also required.

HOW TO ORDER **Send your personal check, money order or charge card information.** Please do not send cash or postage stamps. For ALASKA, HAWAII, U.S. POSSESSIONS Orders: Personal checks delay orders because of slow clearance in those areas. Send money order or cashiers check only.

PACKING AND GUARANTEED DELIVERY **Please use the Packing & Guaranteed Delivery Chart** to determine the appropriate charge. This charge includes postage costs, insurance, guaranteed delivery and careful individualized packing & handling by Edmund Scientific. To compute this charge, simply find the range within which the dollar amount of your order falls on the chart and add the accompanying charge. *For example,* if your order totals $14.95, this falls within the $10.01 to $25.00 shipment range. The charge for an order in this range is $1.75. You would then add $1.75 to the box to the right of the chart on the order form. Items marked T.C.C. (Transportation Charges Collect) are shipped via motor freight with shipping charges due upon delivery. The chart below does not apply to items marked T.C.C. For shipping cost estimates call your local carrier. This type of order requires a street address.

On all orders shipped to the U.S., its territories and possessions, please add the following charges to each order:

SHIPMENTS UP TO $10.00 ADD	$1.30
SHIPMENTS FROM $10.01 TO $25.00 ADD	$1.75
SHIPMENTS FROM $25.01 TO $50.00 ADD	$2.50
SHIPMENTS FROM $50.01 TO $75.00 ADD	$3.00
SHIPMENTS FROM $75.01 TO $100.00 ADD	$3.50
SHIPMENTS OVER $100.00 ADD	$4.00

Large telescopes will be shipped Transportation Charges Collect (T.C.C.)

PURCHASE ORDERS **On Open Account orders** there is a $15.00 minimum for well-rated firms and educational institutions. Purchase orders must be signed by an authorized person. If confirming, please indicate. ALL PURCHASE ORDERS WILL BE SHIPPED F.O.B. Barrington, N.J.–the Packing and Guaranteed Delivery chart does not apply to Open Accounts. If you request special shipping (air mail, parcel post, special delivery, etc.) such costs should be authorized on your purchase order. Terms are net 30 days. We reserve the right to assess a 20% re-stocking charge for merchandise returned after 30 days. To establish credit, send one bank and two commercial references, unless your company is well-rated in Dun & Bradstreet. Credit checks normally take 4 6 weeks. If in a hurry, please send us your check, as well as your references with your first order.

PRICES **Prices in this catalog are effective September 1, 1979** and supercede all previous catalog prices. We strive to maintain the lowest possible prices in compliance with Wage & Price Guidelines established by the President, and will try our best to deter future increases. Prices in this catalog are subject to change without notice. Sometimes it is necessary for us to increase prices on selected items due to increases in prices to us. Thank you for understanding.

HOW TO PURCHASE A GIFT CERTIFICATE **Birthdays, anniversaries, Christmas, graduations . . .** if you can't decide on a gift for someone special, why not let them browse through our catalog. We will send a gift certificate (any amount, $10 or over) along with a gift card with your best wishes and a FREE Edmund catalog. Great for prizes and awards, too! Gift certificate requests should be sent: Attention Gift Dept.

MORE THAN ONE CATALOG? **Do you receive more than one catalog in the mail?** If so, please send us the label(s) from the catalogs you do not want. This will enable us to give you better service and also save money by eliminating duplication. After you've returned the label why not give the extra catalog to a friend?

3 WAYS TO STAY ON OUR CATALOG MAILING LIST!

1 The easiest way to stay on the Edmund Scientific catalog mailing list is to purchase from our catalog. Unless you indicate that you do not wish to be sent further catalogs, you will automatically receive future editions of the catalog, FREE!

2 If more than one individual in your business or household will be ordering from the catalog, unless each individual wishes to receive a separate copy of the catalog, it is best to order under one name where possible. Check to be sure that your address is correct on your order form, too.

3 If you are moving, or if you would like your next catalog sent to another address, either note that information on the order form provided, just beneath the printed address or send us the new address under separate cover. Remember, if you would like a colleague, friend or relative to receive a catalog, please fill out the special 'Send a Catalog to a Friend' portion of the return envelope.

OUR NEW ORDER PROCESSING

DIRECT TELEPHONE LINE

(609) 547-8900

WEEKDAYS, 8am to 5pm EST/EDT

After 5pm EST/EDT weekdays, weekends and holidays call:
(609) 547-0018
Have ordering information on hand.

Name _____

Address _____

City _____

State _____ Zip _____

PLACE
STAMP
HERE

Edmund Scientific Co.
Attn: Order Processing Department
101 E. Gloucester Pike
Barrington, New Jersey 08007

RUSH: Order Enclosed!

Use this convenient snap-out return envelope to send us your order.

Detach along perforation and insert your completed order form along with check or money order (or credit card information filled in where requested on order form.) This will insure the fastest service possible.

TEAR HERE — HAVE YOU: ☐ COMPLETELY FILLED OUT ORDER BLANK? ☐ ADDED THE PACKING & GUARANTEED DELIVERY CHARGE? ☐ SIGNED YOUR CHECK OR MONEY ORDER? — TEAR HERE

[Please do not send stamps or cash]

Comments & Quotes

From Our Customers . . .

"Personally, we have a very special regard for Edmund Scientific. Most of our special effects – animation, front projection, unique lighting – are done with fairly sophisticated equipment that we have custom built from parts and components found in Edmund Scientific's mail order catalog and at a price so low that we can't help but grin about it from time to time."

Ashley Wilkes, President
American Brainstorm Cinema
St. Paul, Minnesota

"Your company is number 1 with us and you will continue to be our first choice for science equipment."

Dennis M. Holt
Chapel Hill Middle School
Douglasville, Georgia

"Let me say how very much the interest and generosity of Edmund has meant to us. We have always been very pleased and satisfied with the quality of your products and your kindness and friendship towards us as customers. It is very nice to have a relationship as real friends. Thank you."

Judy Anne Rider, Chm.
Salt Lake Astronomical Society
Kearns, Utah

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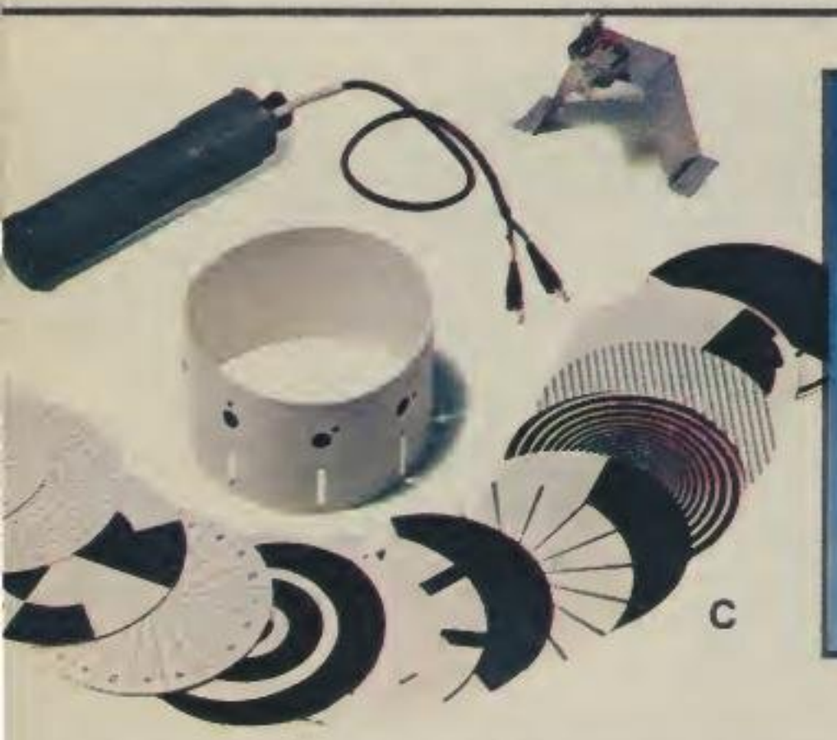
7787

Behavioral Sciences


C

A

B

D

This new science involves the combination of sounds & thoughts to help you study, sleep, concentrate or meditate. You don't always "listen" to these sounds; you unconsciously participate and interact with them. These sounds provide a tranquil environment for the subconscious, helping your conscious mind proceed with the tasks at hand.

Rest Your Mind And Body With Sound Conditioners

(A) Edmund Professional Sound Conditioner: Need a restful, contemplative atmosphere in which to think, read, sleep or relax? The Edmund Deluxe Sound Conditioner helps mask unwanted noise while adding restful background sounds. Used by light sleepers, apartment dwellers, travellers & others, it simulates soothing sounds of the ocean surf, falling rain & a rushing waterfall. 4 controls & 4 sound channels adjust for your personal taste. **Surf 1:** repeating, single-breaking ocean wave pattern; **Surf 2:** random pattern of waves breaking on a beach; **Rain:** heavy downpour masks intruding noise; **Waterfall:** a deep "roar of Niagara" that's also great for masking loud sounds. Attractive black, white & silver case; 5" dia. speaker; 7½ ft. power cord; power-select switch for 115/230 V AC, 50–60 Hz current. 5½x7½x6½". 3 lbs. **No. 72,293 $129.95**

(B) Low-Cost White Sound Conditioner: An ideal "sound screen", this model makes "white sounds" only. Produces a steady, pleasant "breeze-like" sound many find helpful for study, reading & sleep. Uses 115 V AC. 3½" high x 6" wide. **No. 71,980 $33.95**

"Environments" . . . A Tranquil Experience

Only $9.95 Each

After reading exciting reviews in the NY Times, Newsweek & other publications, we decided to investigate this series of superb recordings. Scientifically designed to help you study, meditate, eliminate unwanted noise or create a romantic mood, these long-playing (1 hr.) 33⅓ rpm stereo records can turn any room into an exotic seashore, driving thunderstorm & more.

Seashore/Aviary: Soothing surf on one side, melodic bird songs on the other. **No. 72,156**

Thunderstorm/Rain in Forest: Soothing rainfall creates tranquil atmosphere. **No. 72,157**

Heartbeat/Wind in Trees: Creates a soothing, romantic atmosphere for intimate occasions. Recommended for biofeedback training. **No. 72,158**

Sailboat/Country Stream: Imagine a trip on the briny blue; wade in a babbling brook. **No. 72,159**

Tintinnabulation/Rural Dawn: Bells slowly, softly sounding & dawn in farm country. **No. 72,210**

Be In/Rural Dusk: Recreation of a moment with the flower children of the '60's & sounds of a hot summer night on a tranquil plain. **No. 72,211**

Dawn/Dusk in Okefenokee Swamp: Recorded amid thousands of aquatic birds & beasts. **No. 72,212**

Meditation: Human Voices/Nature Sounds: Inner-reflective sound of 120 blended voices in single-syllable sustained chant & hypnotic drone of a vast sea of cicadas in summer cornfield. **No. 72,213**

Pkg. of 4 records (A,B,C,D)	**No. P-72,160**	**$36.88**
Pkg. of 4 records (E,F,G,H)	**No. P-72,214**	**$36.88**
SAVE! Buy all 8 records for only $69.88	**No. 72,215**	

You Can Obtain The Most Popular "Environments" In Super-Quality Stereo Cassettes!

$7.98 Each

Create a special mood at home, in your car or anywhere you wish. These high quality tapes play continuously on any cassette player. Each cassette has special cleaning leaders.

Slow Ocean With Seagulls: Subtle, insistent rhythms of the sea. **No. 42,757**

Crickets: Sounds from afar or nearby? You can't really say. Sound is soothing and aids in conversation. **No. 42,758**

Ultimate Thunder: You can almost see the blue-white glimmering of lightning! **No. 42,759**

English Meadow: Unrivaled beauty & melody of the Sussex countryside makes your living space seem brighter, more spacious. **No. 42,760**

Sailboat: Turn your living room into an ocean-going vessel, complete with creaking mast, circling gulls & the splash of salty spray. **No. 42,761**

Sounds To Scramble Your Auditory Sense

How does the human brain sort & organize complex tonal stimuli? You haven't heard anything until you've heard this mind-boggling series of stereo auditory experiments (stereo player & headphones required). Each album includes detailed descriptions, auditory experiments & in-depth articles by well-known researchers in the field of perception. **Auditory Beats in the Brain:** monaural & binaural beats, effect of tone amplitude on beats, masking tone by noise. **Musical Illusions:** 2-tone auditory illusion, perception differences in the 2 ears, non-harmonic 2-tone sequence, tonal patterns. **Musical Staircase:** audio illusions of never-ending ascending & descending tones.

All 3 recordings on cassette tape. No. 72,232 $19.95

Is Seeing Believing?

We cannot always trust our eyes for correct information. We must supplement our visual images with "brainwork". Many contradictory theories exist concerning illusions, yet they are fun to view & learn about. Scientists, psychologists & hobbyists will be fascinated by famous illusions like Zollner's, Wundt's, Schroeder's Staircase, Oscillating Figures, Simultaneous Contrast and more.

40 Optical Illusion Slides

35 mm color and black & white slides of the most popular optical & perception illusions. Includes guide giving historical background, categorization & explanation of each. **No. P-42,142 $17.95**

25 Optical Illusion Cards: Set of the best black & white illusions on 8½" x 11" card stock. Instructions included. **No. 71-728 $9.95**

(C) Create Optical Illusions With Whirling Wonders Can you really see colors in black & white discs? How do shapes change before your eyes or objects appear that aren't really there? It all happens with whirling wonders! Set of 20 (5") discs, batt. holder w/built-in rheostat, small motor on bracket, bulb & socket. Instr. incl. **No. 70,414 $23.95**

Disc Set: Above without motor & holder. Use your own variable speed motor. **No. 70,424 $9.95**

(D) Mirage® . . . Confounding and Amazing! You will see a 3-dimensional, shiny, "touchable" object resting on top of this amazing disc . . . but reach for it—and find nothing! Everyone is baffled! Place any small object inside the unit and replace the lid. The object will appear to be resting on the lid itself. In school, use it for optical demonstrations on parabolic reflection—even use the 2 precision glass parabolic mirrors for experiments in solar energy & sound reflection. 9" dia. w/4" dia. clear plastic stand. **No. 72,074 $64.95**

3D Optical Illusions Color & Construction Book. For home & classrooms; has 5 dazzling projects that let children enjoy the mystery & beauty of optical illusions. Incl. explanations. **No. 9567 $2.50**

"Illusions: A Journey Into Perception" by P.A. Rainey. A great supplementary guide to the above illusion sets. 110 pp; 7 x 10"; paperbound. **No. 9474 $6.00**

Health

(A) Distill Your Own Water At Home–Enjoy Pure, Fresh Water! This high capacity, stainless steel, home distiller delivers 15 to 18 gallons of purified water per day . . . ¾ gal./hr. And it's automatic! The flow control fills & shuts-off automatically without constant supervision. Enjoy a whole new flavor in coffee, tea and soups. Ideal for lab work & photo processing where pure, chemical free water is needed. Weighs just 9 lbs. & is only 8" in diameter. **No. 72, 463 $169.00**

(B) "Your Water & Health" Book. No. 9500 $2.25
See pg. 35 for more water distillers.

Protective Ear Valves: Protect against harmful high frequency noise, yet let you hear a whisper. Unlike earplugs, they leave the ear canal open to normal air circulation, thus reducing the risk of dizziness. Special formula silicone–rubber offers maximum comfort. Nontoxic, non–allergenic; resistant to ear wax, skin oils. May be sterilized. Fit most ears. **No. 41,464 $5.95/Pr.**

Home Vision Testing Kit: Includes a professional–type eye test chart, preschool eye test chart, 8 page sight information manual, occluder, tape measure & sticker listing first aid information for eye emergencies. **No. 61,226 $5.95**

Check Color Blindness With Professional Pseudo–Isochromatic Plates. This clinical testing kit is useful for detecting types of color blindness. The set contains the most current color combinations with a special section designed for testing young children and those with reading disabilities. Includes testing procedures, sample record form, color wheel, 34 pp. manual, case. 6¾" x 7". **No. 9483 $59.95**

(C) Highly Accurate Digital Thermometers: For home, laboratory & industry. Obtain extremely accurate readings with these exceptional thermometers. Products of microprocessor technology, they measure temperature & display results in Celsius and Fahrenheit. **Temp. Range:** 32°–230°F or 0.0°–110.0°C. **Accuracy:** ±0.2°F or ±0.1°C in biomedical range; ±0.5% over entire range. LED four digit display. Battery operated (9 V). **No. 61,174 $64.50**

Rechargeable NiCd battery unit w/recharger and larger digital readout. **No. 61,175 $89.50**

NEW! Cronus Strider Jogging Instrument. Casual joggers & seasoned runners alike use this electronic pacer to set a steady stride & improve rhythm & distance. Clip unit to waistband & listen to "beep" through earplug. Battery-operated, it weighs just 2 oz. **No. 42,753 $19.95**

(D) Electronic Pulse–Minder: Uses a fingertip probe that quickly measures the pulse rate. Pulse beat can be seen by a flashing red LED light or seen & heard via the red LED & a beeping sound device. Needle meter calibration from 30–200 beats in 5 beat increments gives exact reading of heartbeat. Bicycle handlebar bracket is included for monitoring heart beat while pedaling. Measures 4"x1½"x2¾". Battery operated (9V). **No. 42,736 $198.00**

(E) Digital Blood Pressure/Pulse Monitor: This digital sphygmomanometer is a compact, battery powered instrument that records blood pressure and pulse beats per minute. Press a button and average pulse rate is visually displayed. No stethoscope needed! Features: automatic cuff deflation, separate systolic & diastolic blood pressure readings & record log. Complete with one year warranty. **No. 72,473 $279.95**

(F) Combination Stethoscope–Blood Pressure Gauge: Deluxe model reads pressure quickly, easily. Stethoscope is built right into the cuff! Features: 20–300 mm aneroid manometer bulb, metal binaural stethoscope, carrying case & instructions. **No. 71,874 $34.95**

(G) Transistorized Electronic Sphygmomanometer: Portable, transistorized—provides consistent, accurate readings of blood pressure without the use of a stethoscope. Anyone can use it . . . it's that easy to read. Highly sensitive microphone, part of the arm cuff, flashes a light that indicates blood pressure level. Also equipped with a sensitive pulse meter, it requires no electrical outlet. Complete with batteries, zipper case & instructions. **No. 1690 $124.50**

(H) Electronic Blood Pressure Gauge: Monitors your blood pressure. Requires no stethoscope; easy to operate. Incl.: blood pressure recording charts, 9 V batt., instr. booklet, gabardine cuff—reverse side velcro w/D-ring slide—and carrying case. 6¾x2½x2¼". 5-step easy operation. **No. 61,233 $89.95**

(I) Combination–Type Stethoscope: Originally designed for use by physicians, this extra–sensitive instrument is excellent for checking engine performance! Bell & diaphragm provide mechanical amplification to permit the user to hear otherwise inaudible sounds. **No. 50,270 $11.95**

(J) "Speaking of High Blood Pressure": This vol. in the "Medical Adviser" series tells you how to determine your blood pressure & how you can develop a routine that will normalize high blood pressure. 128 pp. Paperbound. **No. 9576 $2.95**

(K) Aneroid–Type Blood Pressure Gauge: Low–cost aneroid–type sphygmomanometer is compact. Includes: bulb, cuff, 20–300 mm scale, case & instructions. Recommended for use with Combination Stethoscope above. **No. 50,271 $24.00**

(L) Transistorized Electronic Stethoscope: For physicians, mechanics & industrial applications. Self–contained, electronic stethoscope amplifies sound up to 100 times! Sliding volume control delivers proper frequency. Powered by two 1.5 V batts.; overall amplitude: 56 db, 100 Hz. Includes dynamic type earphone w/600 Ohms impedence. Size: 47 mm dia. x 34 mm length. **No. 61,223 $139.50**

(M) Sensitive Blood Pressure Monitor Set: Accurate home monitor set w/stethoscope! Professional quality instrument—easy to read scale. Incl. record log & complete instructions. **No. 72,422 $49.95**

(A) The Three Dimensional Mirage®. Now you see it—but it's NOT there! Place any small object inside the Mirage® & replace the cover. Like magic, you see a 3-dimensional object resting on top of the disc. But try to grasp it & you encounter thin air! Displays an unusual parabolic optical effect. Made of durable plastic, incl. two 9" mirrors. When photographed, the object still seems to be there. **No. 72,381 $34.95**

See our glass optical illusion demonstrator on Pg. 52.

(B) New Ideas in Silk Screen Printing! Print on paper, glass, wood and more. Decorate ties & T-shirts. Ink pushes thru silk screen & is deposited on the surface. Requires only soap & water cleanup. Reproduce fine line drawings & photos from a positive. Incl.: 10x14" screen, 6 ink colors, brush, instructions. A most unique kit! **No. 71,873 $34.95**

(C) Read or Watch T.V. While Reclining in Comfort! These precisely aligned crown glass prisms bend light so you can read while in a reclining position! Approved by leading ophthalmologists, optometrists & physicians. Can be worn with regular eyeglasses. Includes vinyl case. **No. 61,039 $29.95**

(D) 7-in-1 Pocket Multi-Tool. Perfect for car, pocket or purse. Only 2¾x2⅜x⅝", it puts 7 of the most widely used tools in the palm of your hand: retractable 100 cm (39.37") tape measure, magnifier, magnet, penknife, miniature flashlight, slotted screwdriver & inside/outside calipers. "AA" battery included.
No. 42,498 $3.49

(E) 12 Brainteasing Hardwood Puzzles: Bewildering assortment of table-top puzzles is perfect gift for problemsolvers of all ages. 12 animal & geometric shapes are easy to take apart but challenging to put together. Largest puzzle approx. 3½x3½".
No. 70,205 $19.95
Set of 6 puzzles No. P-71,515 10.95

(F) Multi-Colored Dream Light. Project streams of flickering, rotating lights. Put it on a table, a TV, even on top of the Christmas tree. Faceted transparent globe has louvered drum of red, blue, green & yellow stars that rotates from bulb heat.
Plastic. No. 71,000 $7.95
2 extra lamps. No. P-41,192 1.95

(G) Fire Ball Kaleidoscope: Features a multi-faceted dome which gives the colored elements inside a new and unusual effect. Turns 360°! **No. 42,713 $3.45**

(H) Classic Optical Toy—The Teleidoscope. Similar to kaleidoscope, but substitutes real images for bits of colored glass. Creates multi-faceted images that fascinate & amuse children for hours. **No. 50,349 $6.95**

(I) The New Kaleidoscope Set. Now you can build your own kaleidoscope. This do-it-yourself kit contains main body complete with 2 containers which can be used separately or at the same time. Includes: color disc w/two optical lenses, sachets containing pretty flowers, novelty shapes, plastic beads & colored twists. Complete instructions included.
No. 61,234 $8.95

(J) Dichromatic Hologram Pendant: This 3-dimensional 44.5 mm disc is mounted as a pendant on a 24" gold-tone chain. Brightly multi-hued, it's attractive & intriguing. See others on Page 85.
Watch Face & Parts Image No. 30,781 $19.95
Rose No. 42,521 19.95

(K) Car of the Future. This science toy hovers a fraction of an inch above any flat surface! Shows low friction motion principles of Ford's and Curtiss-Wright's air cars. Sturdy plastic, 8"x9"x2" high; 4" propeller; 48" control line; batt. case. Uses 2 "D" batteries (not included). **No. 70,307 $7.95**

(L) Pocket Size Solar Cigarette Lighter: Great gift for your smoking friends. Place a cigarette into the folding holder & point it at the sun. No fuel needed. Works indoors when exposed to the sun through a window. Complete with carrying case. 3x5" oval.
No. 40,307 $2.50

For other solar products, see pages 32 to 34.

(M) 15-Inch Curved Prism: Have you ever witnessed the beauty of a rainbow after a rain shower? Now you can take the beauty of a rainbow home with you. All you need is a sunny window and this 15-inch curved prism. It uses the optical properties of a prism and a lens to focus & shape a spectrum of brilliant colors. As the suspended prism rotates, spectral patterns are projected & fluidly change shape. Adjust the prism orientation on the balance stem to obtain different color effects. **No. 72,393 $19.95**

(N) Wide Angle, Flexible Fresnel Lens: Turn a limited view into a panoramic scene! Photographers use it for wide-angle, fish-eye & distortion shots. Mount on a window to get wider view. Pull to remove; leaves no mark. 10½" dia.—8.5 fresnel lens asphericized to eliminate spherical aberration. Optical grade polyvinyl chloride. Incl. 16 pg. "Fun With Fresnel Lenses" booklet.
No. 71,542 $6.95

Colored Fresnels Like Above (book not included)
Blue—No. 72,240, Pink—No. 72,241, Yellow—No. 72,242, Red—No. 72,253. $5.95 Each

(O) Rainbow Glasses: Unusual party favors, these glasses divide light into brilliant colors. A bright light looks like a technicolor snowflake! Diffraction gratings mounted in cardboard frames are the secret. One size fits all. 5 per pkg. **No. P-42,319 $4.95**

(P) Fantastic Fresnel Lens Sheet—See 25 repeats at one glance. 8¾x10" transparent plastic sheet of 25 separate $1\frac{3}{16}$x$1\frac{5}{16}$" negative Fresnel lenses, all 67 mm F.L. Look thru & see 25 wide-angle repeats of one scene. Fun for artists, hobbyists, etc. **No. 60,811 $3.95**

Project The Spectrum With A Fun Glass Prism! 90° precision ground & polished optical glass prism disperses "white" light into a rainbow of color. Base meas. $1\frac{1}{16}$". Instr. **No. 8100 $1.50**

Also see No. 1002, next Page, Edmund Scientifics Kit.

Mysterious Spinning Top. Spin top & watch it keep going—defying Nature's laws. 3 oz. **No. 42,317 $9.95**

NEW!

NEW!

NEW!

(A) "Think Sticks" help students visualize in 3 dimensions. Easy to use & durable—⅛" dia. plastic sticks fit snugly into 1" dia. polyethylene joints w/⅛" sleeves to form rigid structures. (Connectors available separately. T–connectors come w/Kit No. 70,211 only). Instructions.

Kit No. 70,209 Introductory Set. 220 pieces . . . 5, 6 & 8 sleeve connectors: 2, 3, 4, 5, 6 & 8" colored Think Sticks. **$7.95**

Kit No. 70,210 for advanced interests. 370 pieces . . . 5, 6 & 8 sleeve connectors: 2, 3, 4, 5, 6, 8, 10 & 12" colored Think Sticks. **$11.95**

Kit No. 70,211. 452 pieces: 5, 6 & 8 sleeve connectors; T–connectors (allow sticks to pass through): 2, 3, 4, 5, 6, 8, 10 & 12" colored sticks; long length of unpainted sticks can be cut to fit need. **No. 70,211 $14.95**

Separate Connectors. Unpainted sticks.

Type	Pkg. of	No.	Price
5–sleeve	50	P-60,108	$8.95
6–sleeve	50	P-60,109	8.95
8–sleeve	50	P-60,110	8.95
T–conn.	50	P-60,111	8.95
24" sticks	100	P-60,112	3.75

(B) Study the Era of Dinosaurs! Reproductions of Mesozoic era reptiles. Molded to 1/45 scale.

Set A. Three replicas—all NEW set. Includes: Tyrannosaurus Rex, Pteranodon and Plesiosaur (shown). **No. 61,228 $12.95**

Set B. Four replicas. Diplodocus, Megalosaurus, Blue Whale and Scelidosaurus. **No. 72,316 $19.95**

Set C. Four replicas. Wooly Mammoth, Stegosaurus, Triceratops and Glyptodont. **No. 61,133 $17.95**

"Age of Reptiles" color poster, 12¼x48". **No. 61,150 $3.50**

(C) Micro/Telescope—Handy pocket size. Dual–purpose: 50X microscope or 10X telescope. 4½" length extends to 8". **No. 41,445 $12.95**

(D) Space Shuttle Enterprise With NASA Mission Patch. Lift–off canopy reveals detailed cockpit! Full 19¼" long (1/72 scale). Removable ESA Spacelab payload, authentic NASA decal markings & opening cargo bay doors. Plus a free NASA Space Shuttle Patch. **No. 72,489 $12.95**

(E) 250 Stars That Glow in Dark: Perfect for decorating wall or ceiling. Chart & instr. **No. 9521 $3.00**

Magnetic Fun & Learning. "Hands–on" teaching aid includes Alnico–V Bar Magnet w/poles marked & painted. 6x¾x¼". **No. 40,421 $7.95**

Iron Filings. 1 lb. Demonstrate magnetic field. **No. 60,176 $2.50**

Magnetic Balls Jump, Wiggle, Defy Gravity. Play loony marbles with 4 magnetized balls that roll in crazy directions. **No. P-60,508 $1.95**

(F) Super Microscope Kit: It's a toy, but it's also a terrific beginner's learning microscope! Virtually unbreakable, it has a 30x–100X lens system w/micrometer focus. Converts to a micro–projector via 35 mm slide projector. Includes: 1 prepared slide, 2 unmounted slides, projection masks, double sided mirror. 6½" high. Ages 8 to 16. **No. 42,751 $14.95**

(G) "Space Art" Book: Compilation of artwork by 65 artists in the space field includes 135 reproductions & plenty of color. **No. 9575 $12.95**

(H) Colorful NASA Mission Patches. 4" dia., colorfast reproductions of official NASA patches. Apollo Skylab Set incl. 11 patches total, each beautifully embroidered.

Project Viking—Mission To Mars. 6-color patch. **No. 42,599 $3.49**

Enterprise—Approach & Landing. 3-color patch. **No. 42,601 $3.49**

Space Shuttle. 3¾" tall, triangle. 5-color. **No. 42,598 $3.49**

(I) The Ballpoint Pen That Went to the Moon. Writes in any position, underwater & in temps. from –50° to +400°F & zero gravity. Hermetically sealed & nitrogen pressurized. Incl. one refill. **No. 60,996 $9.95**

Pkg. of 2 refills **No. P-61,002 2.95**

Big Bang Cannon Noisemakers for Celebrations. No gun powder or matches used. Push igniter & cannons give off loud boom. Cast iron bodies. Instructions included. ADULT SUPERVISION RECOMMENDED FOR CHILDREN. ***Not available to New Jersey residents.**

Big Bang Cannon for LOUD report. Over 2' from muzzle to beam. 5½ lb. Requires ammo below. **No. 71,654* $29.95**

Low–Cost Cannon. 9x¾" on heavy–duty wheels. 1 tube ammo. incl. Cannot be air mailed. **No. 70,898* $14.95**

2 Tubes Ammo (200+ shots). Powered calcium carbide mixes w/water. **No. P-41,005* $2.95**

(J) Replica of Pioneer 10 & 11 Plaque. Gold-tone etching indicates launching details. 9x11". **No. 71,707 $26.50**

See How The Earth Spins With Gyros! Fun & intriguing toys illustrate the phenomena of bodies moving in space.

Gyroscope (conventional model) **No. 42,712 $3.95**

(K) Modern version Gyroball: displays a beautiful silver–colored ball. Complete with its own standing tower. **No. 42,755 $4.95**

Human Anatomy Model Kits.

(L) 1/5 Scale Human Skeleton Model Kit. Fully articulated. 16½" tall. Glows in dark. **No. 72,217 $4.00**

(M) Visible Man. Authentic, take–apart model of human male. 16" high. **No. 70,228 $8.95**

Visible Woman. 15½" high human female model includes structure for 7 months pregnancy. **No. 70,283 $8.95**

(N) Life–Size Human Skull. Removable skull cap; spring action lower jaw; stand. **No. 71,539 $5.25**

(O) 8X Refractor Telescope Kit. Ideal for Astronomy Group Projects. Specially–priced for larger group projects. Powerful enough to view craters on the Moon! Finished telescope measures 18" long x 1¾" dia. Complete instructions included. **No. 71,473 $9.95**

10 Kits. No. P-71,474 only $79.95

(P) NEW! "Scientifics". Explore the forces of nature & science! Each kit complete with materials, instructions and educational explanations.

Magnets	**No. 1001—$2.98**	**Illusions**	**No. 1005—$1.98**
Prism	**No. 1002— 2.49**	**Color**	**No. 1006— 1.98**
Mirrors	**No. 1003— 1.98**	**Jumping Discs**	**No. 1007— 1.98**
Weather	**No. 1004— 3.49**	**Science Oddities**	**No. 1008— 1.98**

For quantities of 24 or over, contact our National Sales Department.

(Q) NEW! Edmund "Thought Provokers". Educational experiment kits for groups.

Fun With Motors: real electric motors & wiring chart to make your experiments easy! 24 motors. **No. 1101 $15.95**

Fun With Lenses: instructions & lenses for optical & magnifying experiments. 100 lenses. **No. 1102 28.95**

Fun With Magnets: 40 pkgs. of 5 magnets. **No. 1103 22.95**

(A) Mechanics Experiment Kit. A complete laboratory in mechanical construction for 100 kinetic & potential energy experiments. 115 components include electric motor & interchangeable gears. Experiments include the catapult, the fly wheel, windshield wipers & car batt. tester. Instr. included.
No. 72,353 $32.50

(B) Create Your Own Optics Laboratory. This kit gets our highest recommendation! Everything you need to perform 135 fascinating experiments in optics & photography. Assemble a 35 mm reflex camera with an interchangeable lens system or re-invent the periscope, telescope & microscope. Fully illustrated, easy-to-understand 112 pp. manual explains usage of over 114 components. Ages 12 & up.
No. 71,846 $29.95

(C) Complete Aeronautics Lab in a Kit. 100 experiments for creative minds of age 12 & up. Explore air convection, aerodynamics, action-reaction & altitude determination. Experiment with propulsion, air pressure, space navigation. Construct a glider, a 27" wing span plane, a helicopter, a rocket with automatic parachute recovery and more. Incl.: balsa wood, wire, glue, helium, balloons, plastic parts & 159 pp., illustrated instr. manual. **No. 71,840 $19.95**

(D) 140 Exciting Electrical Experiments. Explore electricity, magnetism & telecommunication. Send messages w/Morse Code buzzer & printing receiver; produce electricity w/generator; make a working phone system or burglar alarm. Illus. 112 pp. manual explains usage of over 135 components. 4 "C" batts. required (not included).
No. 71,847 $19.95

Experiment With Electronics. No soldering, snap-fit assembly. Complete radio & electronics laboratory. Contains 100 experiments & 188 components. Some of the many constructions included are: transistor radio, lie detector, burglar alarm, amplifiers & metronome. Ages 12-adult.
No. 72,208 $24.95

(E) Nautical Laboratory by Logix. Over 100 experiments in buoyancy & propulsion. All parts for each experiment included. Construction details described in fully illustrated manual take you through a history of the sea & navigation. Build models of a dugout canoe, a raft, a rescue ship & more. Has 2 interchangeable motors, 2 remote control tethers. **No. 72,354 $28.50**

Educational Kits Developed by Bell Labs

(F) Speech Synthesizing Experiments. Designed for high school & jr. college students interested in speech. Includes components to construct an electronic vowel synthesizer. Accompanying book explains the physics & biology of verbal & psychological factors involved in speech.
No. 81,169 $27.95

(G) Crystals And Light Experiments. Contains components for assembling polarizing microscope. Conduct 35 experiments with included colored filters, samples of mica, ADP & other crystalline materials. Two manuals detail theory involved & outline different projects & experiments. Created for high school students. **No. 72,395 $29.95**

(H) Save $$ On Many Household Items. Practical books show how to save hundreds of dollars by making items for the home, auto and personal use. Paperbound.
The Formula Book 210 pp. **No. 9537 $5.95**
Formula Book 2 195 pp. **No. 9538 5.95**

Books On Biorhythms & Other Body Rhythms

(I) "Biorhythms & Your Behavior", V. Mallardi: A combo text & workbook explaining biorhythms with fascinating examples. 8½x11, pbk., 68 pp. **No. 9137 $4.95**
"Is This Your Day", Thommen. Empirically explains biorhythms & tests accuracy. 182 pp. Hardback. **No. 9477 $6.95**

(J) "The Flying Circus of Physics" by J. Walker. Investigates theories behind fun phenomena like Frisbees, sand dunes & soap bubbles. **No. 9566 $9.95**

(K) Star City Plastic Building Blocks. Clear plastic building blocks & cylinders snap together easily to form futuristic buildings. Unbreakable & safe. Ages 3 & up. **No. 72,416 $17.95**

Star Trek Is Back With 2 Action Ships.

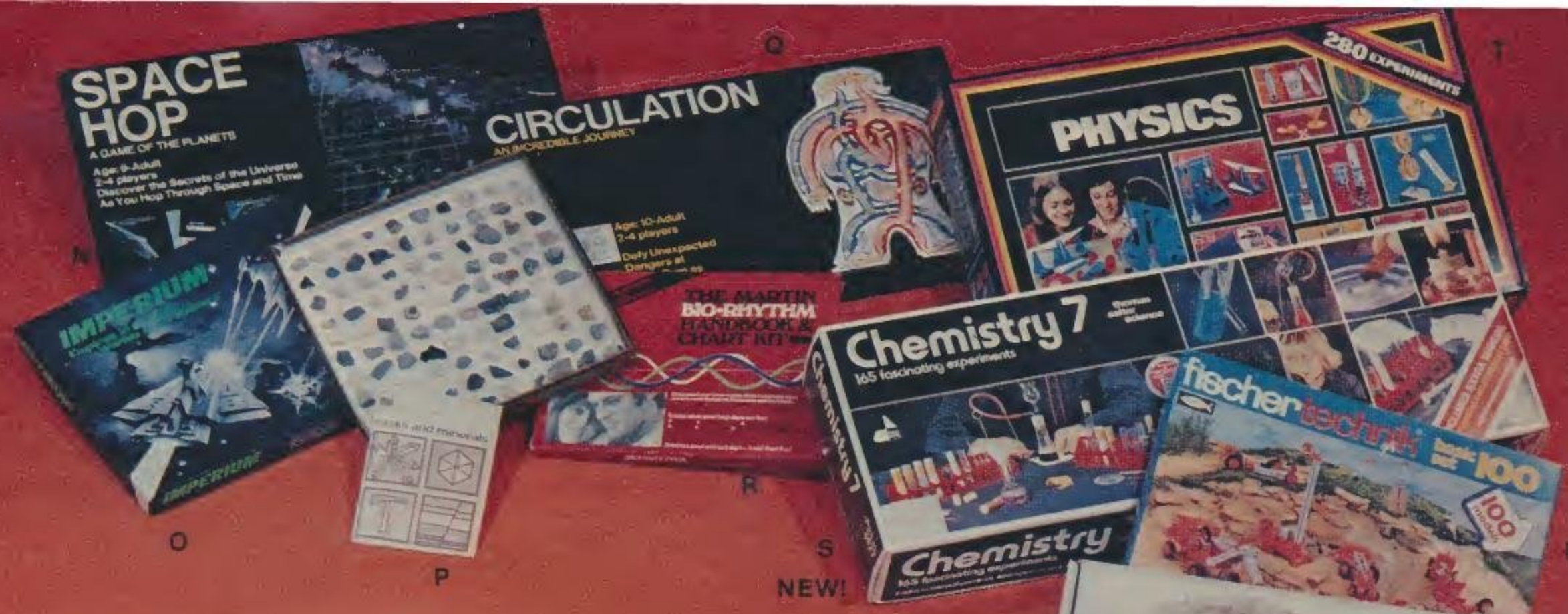
(L) Captain Kirk's USS Enterprise Starship. Sturdy die-cast metal toy includes small shuttle craft & soft photon torpedoes. White w/orange details; 10" long. **No. 42,715 $12.95**

(M) Star Trek Klingon Cruiser. Fires safe photon torpedoes. **No. 61,212 12.95**

(N) Space Hop . . . A Game of the Planets. Exciting, fast-paced, astonomical game for 2-4 players teaches you the secret of the universe. Space Hop Decoder helps you navigate through encounters with Hyperspace, Space Bumps & the mysterious Space Portals. Ages 9 & up. **No. 71,937 $13.95**

(O) Imperium Science Fiction Game. Two players use strategy & tactical expertise to compete. Utilizes a 2-dimensional map of near solar space. Recommended for ages 12 up.
No. 72,431 $12.50

(P) 100 Piece Rock & Mineral Set. A fine introduction to rock collecting. Compares with those found in the field. Includes 67 pg. book "Introduction to the Study of Rocks and Minerals."
100 Specimen Set. **No. 71,176 $14.25**
36 Specimen Set w/book **No. 40,329 5.00**
15 Piece Fluorescent Mineral Set. A broad view of fluorescence in U. S. & Canada.
No. 71,802 $9.95
30 Animal & Plant Life Fossils. **No. 50,344 4.95**



(Q) "Circulation" An exciting game that takes you on a fantastic voyage inside the body! Be the first player to supply the arms, legs & head with food and oxygen. Fight off germ attacks & cope with the unexpected emergencies. Ages 10 & up. **No. 80,293 $17.75**

(R) Prepare Bio–rhythm Charts For Yourself & Your Friends. Has 3 calibrated rhythm templates, 15 charts, 3 pens, complete instr. & a calculator you set once a year to dial your bio–rhythm cycles in seconds.

Complete Kit w/calculator	**No. 72,271**	**$23.50**
Extra charts Pkg. 15	**No. 72,270**	**2.75**
Calculator only	**No. 42,499**	**13.95**
Kit without calculator	**No. 72,269**	**9.95**

(S) The New Deluxe Chemistry Kit. Impressive top–of–the–line chemistry set contains a 72 pp. instr. manual & everything you need for 165 exciting experiments. Excellent for high school students. Includes: 2 equipment racks, metal test tube rack, 20 test tubes 3x½", glass cutting file, large spirit burner w/cap, safety goggles, spatula, glass stirring rod, 25 chemicals, special chromatography paper & more. **No. 80,297 $79.95**

Intermediate Chemistry Set. 104 experiments including exploration of states of matter, solubility & filtration. 72 pp. explanatory manual. Ages 10 & up. **No. 72,503 $34.95**

(T) Study Physics & Learn through Experiments. Over 100 components & a fully illustrated experiment book! Feature experiments incl.: working electric motor, galvanometer, pulley system pendulum, optical illusions and more. Also incl. 280 exciting physics experiments for ages 12 through adult. **No. 72,216 $38.95**

(U) Basic Building Set. Make 100 models. Incl. wheels & gears for realistic reproductions. **No. 72,432 $44.95**

Deluxe Set. Makes 300 models. **No. 80,287 89.95**

Accessory Kit for sets above. Modular system of girders lets you make bridges, cranes & other large scale models. **No. 42,705 $39.95**

Motor Pack. Turns models into remote–control machines. Incl. motor, U–joint, reduction gears & batt. case. 3 "C" batts. not included. Use with any basic Fischertechnik set. **No. 42,706 $34.95**

(V) Colonization of Mars Game. "Survive" . . . if you can. The game board is an actual geophysical survey map of the planet Mars. Race against time, disasters & other colonies. 2–6 players of all ages. **No. 72,401 $12.00**

(W) Giant Ant Farm. Watch these hardworking, patient ant engineers build rooms & tunnels. See them sow, reap, harvest & store food. Unbreakable plastic 10"x15" case. Incl.: sand, ant watcher's manual, certificate for supply of live ants (takes approx. 2 wks.) Excellent classroom fun. **No. 70,295 $12.95**

"The Ants" by Dr. W. Goetsch, paperbound 174 pp. 85 illustrations. **No. 9351 2.95**

(X) Magni/Tease Puzzle. 12 magnetized cubes must be arranged in the proper configuration in order to stay together. Thousands of combinations possible, but there's only one solution. **No. 42,665 $12.00**

(Y) WFF'N Proof Games. 21 games of modern logic make learning fun. Set starts with relatively simple games & ends with subtle games that challenge even the advanced adult. Case stores logic cubes, playing mats, timer & 224 pp. instr. manual. Ages 8 to adult. **No. 60,525 $12.95**

WFF'N Proof Equations. 5 game kit of creative math for grades 1–12. **No. 60,526 9.95**

(Z) Exact Scale Model Of Cheops Pyramid in Egypt. Do pyramids really preserve material inside them? Try it for yourself! Comes preassembled in tinted acrylic. 6x9¼x9¼". Livens up parties! **No. 71,817 $16.95**

Educational And Fun Science Projects Kits

(AA) Discover the World of Optics! Perform dozens of experiments w/14 lenses, a prism, diffraction grating, 2 polarizing filters, star & planet locator, magnifier & 3 illustrated booklets. **No. 50,204 $14.95**

Water Testing Kits. Indicates dissolved oxygen, hardness, chlorides, phosphates & hydrogen sulfide in water. Includes 6 vials of chemicals (enough for 3 tests ea.), reagents & instructions. **No. 71,472 $24.50**

Pollution Test Kit. Great ecology starter kit for age 8 to adult. Over 30 experiments included w/safe chemicals, apparatus & 48 pg. instr. bklt. Detect & measure aldehydes, sulphur dioxide, ozone, carbon monoxide, carbon dioxide in air, water & soil and alkalinity & acidity. Teaches what pollution is & possible solutions. **No. 71,548 $14.95**

"Anti–pollution Lab" 128 pp. book. **No. 9437 2.95**

Everything To Grow Crystals. Perfect for Science Fair projects, kit includes generous supply of the chemicals you need to grow large display crystals. Instr. booklet incl. Adult supervision required. **No. 70,336 $24.95**

AA

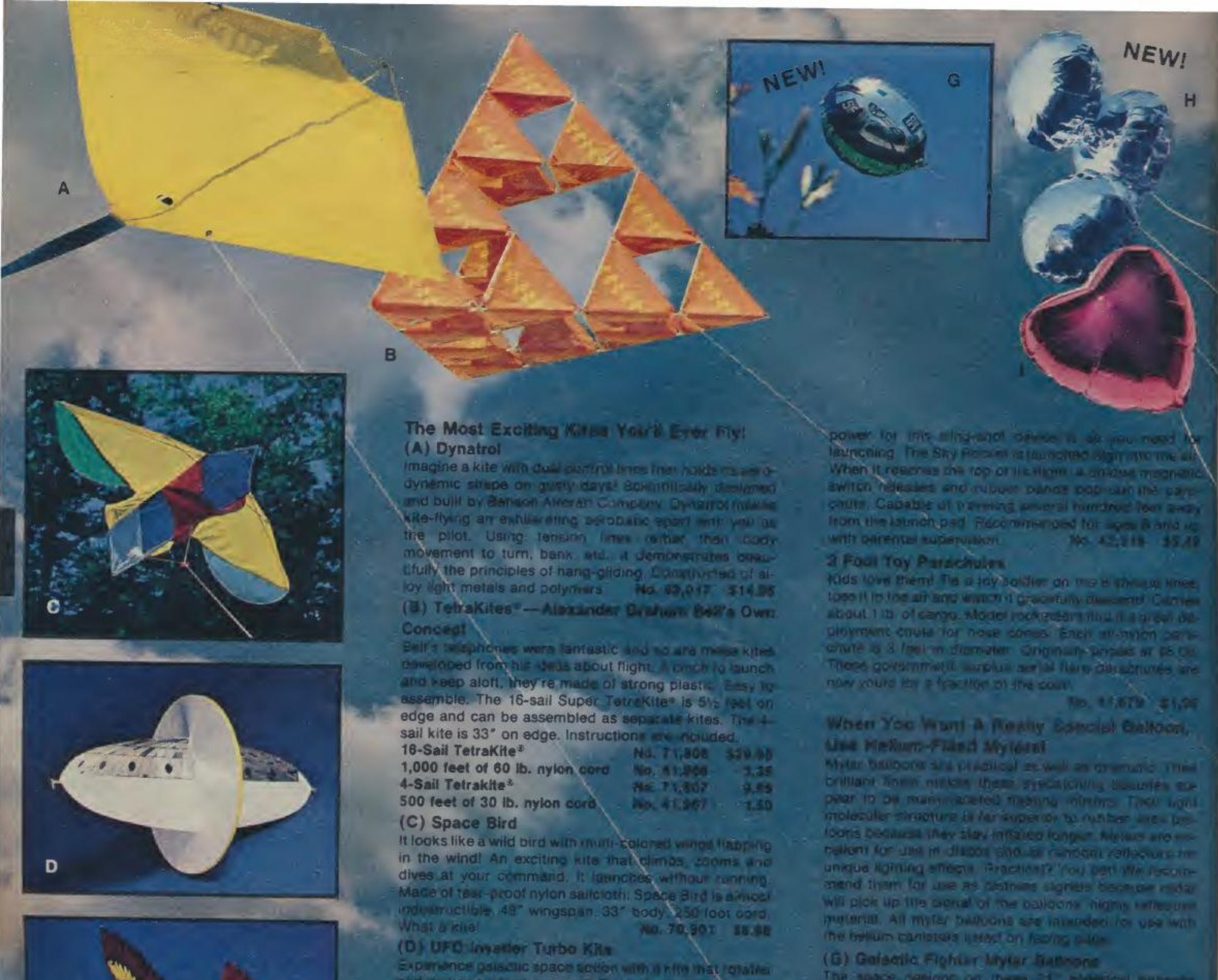
Fun Kits . . .
Educational, Too!

Grow Beautiful Crystals in just 3 to 7 days. They're fun . . . educational . . . easy to grow. Adult supervision required because of chemicals. **5% Chrome Alum (light purple) No. 71,917; Potassium Alum (clear) No. 71,916; 15% Chrome Alum (medium purple) No. 71,918. All kits are $7.95 each.**

Science Project Idea Books:

"700 Science Experiments for Everyone" How to create clouds in a bottle, weigh the air, etc. Many use household materials. 200 pp. **No. 9301 $6.95**

"Junior Science Projects." Illustrated experiments in electronics, physics, optics, astronomy, etc. Ages 9–18. 175 pp. **No. 9397 $7.95**



The Most Exciting Kites You'll Ever Fly!

(A) Dynatrol

Imagine a kite with dual control lines that holds its aerodynamic shape on gusty days! Scientifically designed and built by Benson Aircraft Company, Dynatrol makes kite-flying an exhilarating aerobatic sport with you as the pilot. Using tension lines rather than body movement to turn, bank, etc., it demonstrates beautifully the principles of hang-gliding. Constructed of alloy light metals and polymers. No. 69,017 $14.95

(B) TetraKites®—Alexander Graham Bell's Own Concept

Bell's telephones were fantastic and so are these kites developed from his ideas about flight. A cinch to launch and keep aloft, they're made of strong plastic. Easy to assemble. The 16-sail Super TetraKite® is 5½ feet on edge and can be assembled as separate kites. The 4-sail kite is 33" on edge. Instructions are included.

16-Sail TetraKite®	**No. 71,808**	**$39.95**
1,000 feet of 60 lb. nylon cord	**No. 41,966**	**3.25**
4-Sail Tetrakite®	**No. 71,807**	**9.95**
500 feet of 30 lb. nylon cord	**No. 41,967**	**1.50**

(C) Space Bird

It looks like a wild bird with multi-colored wings flapping in the wind! An exciting kite that climbs, zooms and dives at your command. It launches without running. Made of tear-proof nylon sailcloth. Space Bird is almost indestructible. 49" wingspan, 33" body, 250 foot cord. What a kite! No. 70,901 $6.98

(D) UFO Invader Turbo Kite

Experience galactic space action with a kite that rotates and makes a whirring sound. Printed with flying saucer detail on bright mylar, it emits strobe-like reflections in bright sunlight. 24" wingspan, 14" stabilizing saucer. Easy to assemble. Fly it with a hand line or fishing rod and reel! No. 72,410 $3.98

(E) The Flying Bird From France

The moment you see it, you'll fall in love with this bird. Beautifully designed, it really flies by flapping its wings! Made of durable, brightly colored plastic, its wingspan measures over 15". No batteries are needed . . . it flies with rubber-band power. Just follow the easy instructions and let 'er go! it'll soar, swoop and glide away. So graceful, you'll think it's real! No. 42,720 $5.95

Blast Off To High Adventure!

Apollo Staging Rockets

Using water and air pressure, both stages of this exciting rocket soar into the air! Partially fill the 2-stage rocket with water, then use air pump to fill the balance of space. Press release button and the 1st stage soars 200 feet. At that point, the 2nd stage rocket blasts off to climb another 100 feet. Included are durable plastic 1st & 2nd stage rockets and a 6" anti-missile rocket, fuel funnel, piston stem and air injection pump.

No. 70,157 $7.95

(F) The Amazing Sky Rocket

What a thrill when the 13" diameter plastic parachute "pops" out of the 5½" tall rocket in mid-flight! Muscle power for this sling-shot device is all you need for launching. The Sky Rocket is launched right into the air. When it reaches the top of its flight, a chrome magnetic switch releases and rubber bands pop-out the parachute. Capable of traveling several hundred feet away from the launch pad. Recommended for ages 8 and up with parental supervision. No. 42,218 $3.49

2 Foot Toy Parachutes

Kids love them! Tie a toy soldier on the 8 shroud lines, toss it to the air and watch it gracefully descend. Carries about 1 lb. of cargo. Model rocketeers find it a great deployment chute for nose cones. Each all-nylon parachute is 8 feet in diameter. Originally priced at $5.00. These government surplus aerial flare parachutes are now yours for a fraction of the cost!

No. 41,879 $1.95

When You Want A Really Special Balloon, Use Helium-Filled Mylars!

Mylar balloons are practical as well as dramatic. Their brilliant, foil-like metallic sheen catches and reflects light, making them spectacularly beautiful. Appear to be manufactured floating animals. Their light molecular structure is far superior to rubber latex balloons because they stay inflated longer. Mylars are excellent for use in displays and as random reflectors for unique lighting effects. Practical? You bet! We recommend them for use as distress signals because radar will pick up the metal of the balloons' highly reflective material. All mylar balloons are intended for use with the helium canisters listed on facing page.

(G) Galactic Fighter Mylar Balloons

The space designs on these 21" spherical balloons make them a favorite with children. Strong enough to withstand several pounds pressure, yet easy to inflate and seal. A great gift or party favor!

Pkg. of 10 Balloons	No. P-61,224	$20.95
Pkg. of 30 Balloons	No. P-61,225	51.45

(H) Silver Mylar Balloons

These silver spheres are extremely versatile . . . use them for parties, promotions or as distress signals. How about ordering a large quantity with your special imprint for trade shows? Call our National Sales Department for information & quantity pricing. 17" diameter.

Pkg. of 10 Balloons	**No. P-61,206**	**$16.95**
Pkg. of 30 Balloons	**No. P-61,207**	**42.95**

(I) Heart-Shaped Mylar Balloons

Create a romantic atmosphere with these 17" half silver, half red balloons. Great for parties—as decorations or as favors!

Pkg. of 10 Balloons	No. P-61,231	$17.95
Pkg. of 30 Balloons	No. P-61,232	43.95

What A Way To Fly!

Paper Airplanes—Easy to Build And More Fun to Fly

(J) "The Great International Paper Airplane Book"

Here's the official fly-them-yourself book of paper airplanes with all of the winning designs from the "Solar-

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competition. Includes technical data, time-aloft records, planes and components from the first International Paper Airplane Competition. The real fun begins when you run the perforated pages to make 20 different airplanes!
No. 97917 $3.95

(K) The Great Paper Airplane Flying Kit

You'll love this super collection of 30 fun paper gliders and rockets. Supplies fast and precision cut for maximum performance, all you do is fold and fly! Six sheets of thin (but strong) paper make over 20 AMA Rapidfire, NASA Space Re-Entry Vehicle, USAF Target Drone, NAP Viscen Bomber, and CCV Aerial Research Aircraft.
No. 12,139 $7.50

Unbreakable Balloons! • For Fun, Special Promotions or Science Projects

Tie your imagination to ours with Balloons are great for stimulating growth for special sales and grand openings. Some can even be used in hard on swimming pool covers. How about selling for space-minded or patriotic celebrations ... even birthday parties? Children of all ages love balloons ... and give every one real memorable "survival fun!"

(L) 6 Foot Flying Saucer!

It's great for air (but it's easy to assemble & launch! Attach a string (letter and your U.F.O. will ascend to the heavens. Like it over and over. It's a snap to repair. Kit includes 16 pre-cut gores made of No. 1 white model paper. 8 red panels for nose/base, wire, cord & instructions.
No. 71,175 $5.95

(M) Sealed Helium Kits Balloons

Handy, lightweight sealed and approved aluminum tank comes filled with low pressure helium and has handy nozzle for easy inflating. No more heavy upkeep! Expensive valuable & time-consuming postage and returns are eliminated when you have your own helium tank. It's ready to use when you need it. Smaller tank measures 9" in diameter and is 17" high with 8 cu. ft. of helium. Larger tank is 13" in diameter and 18½" high with 14 cu. ft. of helium. Tanks are non-refillable. Safe enough for children, helium balloons provide hours of fun for the entire family!

Small tank & 50 Balloons	No. 72,452	$39.95
Large tank & 100 Balloons	No. 60,291	54.95

(N) Edmund's Happy Helium Balloon Kit

Treat yourself or your children to a helium-filled balloon whenever the mood warrants it! Each kit includes 20 colorful balloons that inflate up to 6" plus 2 pressurized cans containing 0.21 cu. ft. of helium each. That's enough to inflate 12 or more small balloons. A great delight at parties and during classroom demonstrations! **Note:** Helium is safe and non-toxic.
No. 71,289 $7.95

Helium Hints: Helium is lighter than air, non-explosive & non-toxic—completely safe for children. Blow your balloons up half way with air, then top them off with helium. Your helium will go *farther!*

Balloons Galore!

Perk up any party, dance or incentive program with brightly colored red, yellow, orange & blue balloons. What an exceptionally low price for so many high quality balloons! Stock up now & save. 1 Gross (1").
No. P-42,178 $9.95

Giant 16 and 18 Foot Weather Balloons

Imagine the excitement these neoprene rubber balloons will create! Originally designed for meteorological study use, they burst at high altitudes but are more durable when less fully inflated. Don't confuse these surplus weather balloons with bag-like balloons of rubberized fabrics selling for $250 or more. They're affordable, utilitarian and easy to inflate with a vacuum cleaner, air pump or helium (for aerial use). Inflation instructions are included. Not recommended for children's games on the ground.

16 Ft. Size	No. 72,151	$31.95
8 Ft. Size	No. 60,568	5.95

(O) Make Your Own 9 Foot Hot Air Balloons!

What fun these colorful paper balloons make. When fully inflated, they rise to about 200 feet on just hot air! 9 feet tall and 5 feet wide, they can lift model airplanes or almost anything up to ½ lb. Use them over and over, they're easily repaired if needed. Kit comes complete with 10 pre-cut red & white gores made of No. 1 model paper, 6 feet of 14 gauge wire for bottom ring, cord and instructions.

9 Foot Kit	No. 60,691	$4.95
Two 6 Foot Kits (they're easier to inflate)	No. P-71,866	6.95

(P) More Fun With 3 Foot Weather Balloons

Is 3 foot balloon more your size? Try them in the backyard or in the pool. Great fun for contests or contrast!

3 Foot Balloons. Pkg. of 2	No. P-41,755	$7.50

(Q) 3 Foot Balloons For Play Or Parties

Liven your day with a set of brightly colored, heavy-duty rubber balloons. Ideal for party decorations, favors & games. Pkg. of 5.
No. P-71,184 $5.95

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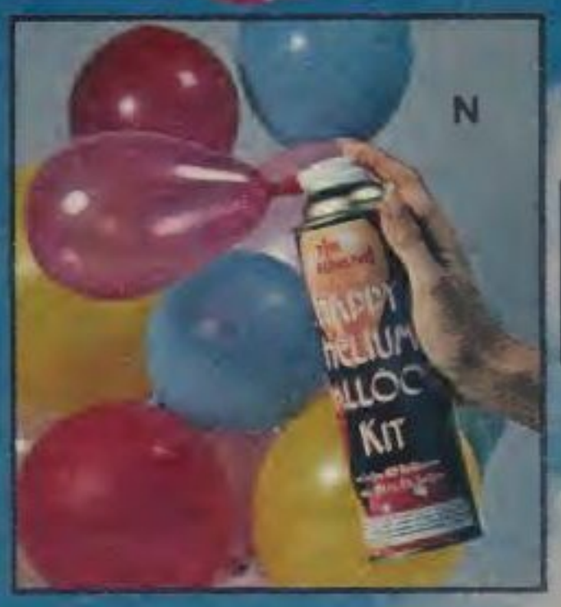

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Science Fun & Gifts

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Creating . . . CREATURES. **"NEW" Mechanimals™.** Build your own creatures that move by remote control! Mechanimals™ Kits let you become the master by supplying all the parts, tools & instructions needed to build eerie creatures that possess life–like motion. All kits incl. assembly tools, detailed instr., electric motor & 6' remote control. Enjoy building & watching these unique Mechanimals™. Kits:

(A) Star Squid "Mini–Mechanimals™": 96 pcs. **No. 72,493 $15.95**

(B) Lunar Inchworm "Mini–Mechanimals™": 91 pcs. Inches along at the push of a button. **No. 72,492 $15.95**

(C) Giant Jumping Jupiter Mechanimals™: Creature leaps at a push of a button. 293 pcs. **No. 72,491 $44.95**

Steam Driven Models—Powerful & Realistic. Made in England. Fully operating models come assembled; made of heavy–gauge brass & steel (10¼x6x7"—4 lbs.). Guide the engines or run them free on dry fuel tablets (below). Each model includes safety valve, brass boiler, steam fittings and new water level gauge for added safety!

(D) Steam Roller Engine. **No. 71,934 $72.95**

(E) Steam Tractor Engine. **No. 72,138 79.95**

Dry Fuel Tablets. Pkg. of 20. **No. 42,324 3.95**

Steam Power! Realistic Dry Fuel Steam Engine Kit. Replica of "Single Action Engine" first invented about 1700. Ideal for mechanically or scientifically minded hobbyists. Great for physics demonstrations. Includes nickel–plated boiler, safety valve, water gauge, throttle valve, whistle & flywheel, all necessary hardware and instr. **No. 72,202 $39.95**

(F) Electrically Heated High–Speed Steam Plant. Powerful! ½" bore x 5/16" stroke. 3" dia. flywheel; hi/lo speed pulleys. **No. 70,822 $59.95**

Miniature Machine Shop. Demonstrates application of steam power and energy conversion. Heavy gauge metal, finished in red enamel with gold trim; mounted on 11½x14" base. **No. 72,169 $42.95**

Visible Scale Engines You Build Yourself!

Visible V–8 Engine. This ¼ scale model includes over 350 parts and does everything but burn oil. Molded in 4 colors, electric motor drive and easy to understand instructions (batts. not incl.) **No. 70,448 $24.50**

(G) Visible Turbo 4: "NEW"! Includes over 65 moving parts. ⅓ actual size, molded in 3 colors. **No. 72,488 $26.95**

Working Model Digital Electronic Computers

Snap Together Digital Computer Kit. Predict the weather. Play computer casino. Solve mysteries. Build this model computer . . . program it to perform 50 experiments! Complete instruction manual starts out w/simple programs & advances to more complex ones. No soldering—snap–together assembly. Uses 3 "C" batts. (not incl.) **No. 71,434 $33.95**

(H) NEW T.E.A.M.M.A.T.E. Computer Game. Challenge your skills with this programmable microprocessor game computer. Play "BLEEP", the moving target paddle game. Compose music electronically with the multi–octave "MUSIC MACHINE". Test your logic with the "STRATEGY GAME" or program your own games. Includes 16 LED displays, two 7 segment displays, 20–key keyboard, program cards & a complete computer board w/programs. A learning game the whole family can enjoy for years to come. 4 "D" batts. (not incl.) **No. 80,290 $69.95**

(I) Electronics Kits You Build. Build 100 projects w/36 plug–in modules. A learning aid to electronics without the danger or permanence of soldering tools. Features Electronic Building Blocks, each an electronic component. Includes antenna, speaker, vol. control, 2 transistors, 2 diodes, variable condenser & more. Max. output 500mW. Power supply: 6 V, 4 "AA" batts. required (not included) 10½x8x2". **No. 72,424 $53.95**

Deluxe Kit. 150 experiments & 46 circuit modules; 400 mA meter; CdS photocell, more. **No. 72,423 $76.95**

MiniLab Crystal Radio Kit. Easy enough for a child! No tubes or transistors to burn out . . . no batteries needed! Features molded base, printed circuit board w/spring terminals, tuning capacitor, earphone, antenna and simple instructions. **No. 61,202 $6.95**

Capsela Motorized Models. Assemble a variety of fantastic motorized models with these see–through, snap–together parts & capsules. Build a moon rover, a weather scanner, a propeller boat and more. Once it's built & running, it's a snap to take it apart & build another. They even work on water! No special tools required. Use 3 "AA" batts. (not incl.).

(J) The New 1000 Series: Fantastic! Construct 85 motorized action models . . . 180 interlocking parts, 10 functioning capsules. **No. 80,298 $87.95**

(K) # 204 Motorized Space Robot: Build your own motorized robot with 35 interlocking parts. **No. 72,477 $12.95**

(L) Capsela 700 Building Set. Construct 47 models. **No. 80,289 39.95**

Capsela Motorized Model #400: 48 interlocking parts, 5 functioning capsules. **No. 72,478 $22.95**

NEW! Electronic Mastermind. Introducing the electronic version of the famous original Mastermind. Choose from nine separate games at 3 levels of difficulty! For one or more players. Includes score cards & instructions. **No. 17003 $38.95**

Working Clocks You Easily Build Yourself. Early American miniature clock kits are complete including assembled clock movement & mahogany case.

(M) Wall Clock Kit: 8⅛ x 3½ x 1⅞". **No. 72,226 $13.95**

(N) Grandfather Clock Kit: 7 x 1¾ x 1½". **No. 72,225 $13.95**

(O) Deluxe Scale Model Grandfather Clock Kit: Over 1 ft. high. Working clock movement made in Black Forest. Adult guidance suggested for children under 10. **No. 72,350 $17.95**

(P) "NEW" School Master Clock Kit: Unique combination of an 1832 design & modern quartz pendulum clock movement. Cased in solid pine with large brass pendulum. 26" x 15" x 5". Wt. 13 lbs. **No. 80,314 $65.95**

(A) Measure Map Distance In Miles, Km
Roll small index wheel along route on your map. Lets you calculate distance in miles, nautical miles & kilometers. **No. 40,469 $10.95**

(B) Chemical Emergency Light/Marker. Unique, lamps for working or signaling help. No power or heat needed. Lasts 3 hrs. (1st hr. like flashlight, next 2 like nightlight). Bright yellow-green light, visible up to 1,000 yds. Pkg. of 4. **No. P-60, 923 $6.95**

(C) Cyalume Multi-Purpose Lantern. Unique lantern holder for item (B) that amplifies & focuses light. It has magnet for attaching to metal, eyelet for hanging on nail or string & clip for belt or pocket. Use stabilizing base for flat surfaces. Sturdy plastic. **No. 42,795 $3.25**

(D) Compact Optical Telescope & Compass. Hand-held, optical telescope & compass device takes direct-sight bearings of your direction. 4-group, 5-element coated lens system w/3X magnification, 7° field, 24° compass angle superimposed on field of view, 360° in 1° increments. **No. 61,172 $79.95**

(E) Space® Age Blanket Scientifically Keeps You Warm. This strong but lightweight blanket reflects a full 80% of your body heat back to you for warmth. It's spacecraft proven. There's no equal for warmth & protection from cold & foul weather. Won't crack or mildew! Weighs 12 oz. Comes in plastic pouch, folds out to a big 4'8" x 7'. **No. 70,886 $12.95**

Disposable Space® Blanket. Like above, but made from a single layer of metalized polyvinylchloride that's flexible at 60° below zero. Use once or twice, then discard! 2 oz. **No. 60,636 $3.95**

Q-Beam Spot Lamp & Spot/Flood Lamps

Use as camp, search, emergency, rally, fishing or photo lights. Operate on 12 V DC or plug into car lighter. Includes built-in hanger, recessed switch guard & 15 foot cord. Portable & waterproof.

(F) Versatile Q-Beam Spot/Flood. Change from a 200M candlepower Spot to a brilliant 100M candlepower wide-angle Flood at a flick of a switch. Impact-resistant case, pistol grip. **No. 72,317 $34.95**

(G) Q-Beam Big Max Spot Lamp. Gives off 300M candlepower! Glare-free bulb. Encased in black, shock-resistant plastic. **No. 72,464 $33.95**

Q-Beam Power Pack for above lamps. Incl. 12V batt. w/8 A capacity. **No. 61,235 $79.95**
Carry Case. Fits either lamp. **No. 72,324 11.95**
Replacement Spot/Flood Lamp. No. 72,326 19.95
Q-Beam Color Filters. Snap on & fit either lamp.
Amber Snap-on Filter **No. 42,561 $3.50**
Red Snap-on Filter **No. 42,562 3.50**
Blue Snap-on Filter **No. 42,563 3.50**

Loud Power Air Horns Can Be Heard A Mile Away!

Ideal for warning others at sea & for personal protection ashore. Just press top or squeeze trigger to release a powerful blast. Do not use indoors.

Miniature Power Horn. Meets U.S. Coast Guard requirements for Classes I, II & III. Durable plastic. 200 blasts. **No. 41,423 $5.95**

(H) Bicycle Power Horn. Mounts quickly on handlebars. 200 blasts. **No. 42,327 $7.95**
Refills for horns (pkg. of 2) **No. P-41,424 4.95**

(I) Thermal Mugs For The Science-Minded. It's the Dewar Flask—dressed in stainless steel. A true silvered vacuum bottle, it can be used as a cryostat to hold ice water, dry ice, acetone or liquid nitrogen. Insulated cap greatly reduces evaporation. **Keeps liquids Hot or Cold up to 3 hours!** Holds 16 oz. **No. 72,347 $19.95**

(J) Select-a-Tenna turns AM radios into powerhouse receivers! Currently used on Alaska's North Slope, it pulls in stations through mutually inductive coupling with your radio. Complete w/jack input. **No. 72,147 $29.95**

(K) Remarkable Flywheel Flashlight. Stop worrying about dead batteries in an emergency! This uses flywheel energy & is perfect for travel. Fits comfortably in your hand, glove box or purse. Red plastic housing, hook for wall hanging. **No. 61,086 $19.95**

(L) Sensational Audio Compass. Guides you along any preset course by ticking when you're off course. The farther off you are, the louder it ticks. Eliminates need for checking compass; clips onto belt for convenience. Runs on tiny mercury batts. Adjustable sound intensity. Mini-lamp accessory gives flashing signal instead of ticking for night use. **No. 42,689 $69.95**

Multi-Use Stopwatches

(M) Quality Stopwatch. For sports, lab, industry. Lockable reset, 7 jewel movement, unbreakable mainspring. Dial reads 1/10 sec., 30 sec. sweep. Small hand reads to 15 min. **No. 42,380 $42.95**
Economy Stopwatch. Reads 1/5 sec., 60 sec. sweep up to 30 min. Lockable reset. Rugged fiberglass case. **No. 42,383 $34.95**

(N) Digital Pedometer. Measure the distance you walk, precisely to a tenth of a mile. Adjusts in ½ foot intervals. Great for hikers, campers, joggers, time study engineers & recreational walkers. Compact. Includes automatic reset button, belt-clip. **No. 41,914 $19.95**

(O) Handy Pocket Altimeter. Precision aneroid barometer graduated in ft. & in. Registers to 12,000 ft. in 100 ft. increments. Use inch scale to forecast weather. Has chrome-plated adjustment ring & hanger; use it to show pressure changes from factors other than elevation. Heavy-duty plastic housing, glass crystal, leather carry case. 2¼" dia. **No. 41,915 $65.95**

Great Buys On Magnetic Compasses

(P) 45 mm Diameter. Polished brass case with beveled glass top. **No. 40,470 $2.75**

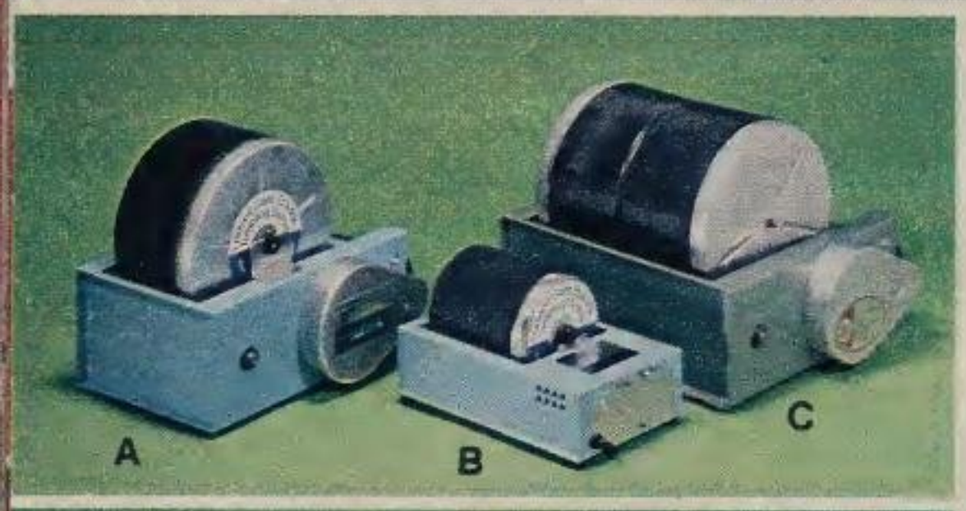
(Q) 16 mm Diameter. Great for kids, party prizes. Pkg. of 6. **No. 40,468 $2.00**

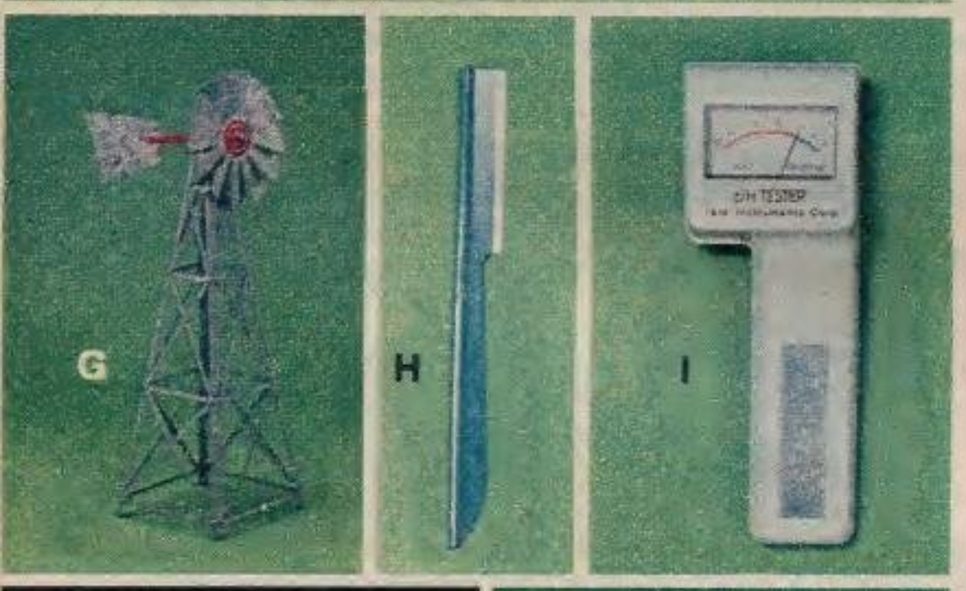
(R) Pocket Lensatic Compass. Look through magnifying lens to find direction you're heading. Hair-line guide for sighting on distant objects while reading position in mils or degrees. Luminous pts. for night use. 1½" dial. **No. 30,235 $8.95**

(S) German Prismatic Compass. Ideal for amateur surveying! Sighting mark in clear lid. Hinged prism, rotating metal dial & index pointer. Liquid filled, jewel bearing, luminous markings. Case & instr. 3½"x2⅝"x1¼". **No. 1929 $62.95**

(T) Pocket Transit/Compass. Valuable sportsman's tool. Combined surveyor's compass, prismatic compass, clinometer, hand level & plumb. Reads vertical angles to ±90°. Has quadrant & 0-360° graduated circle; declination adjustment accurate to 2°. Wt. 3 oz. 3 3/16"x3¼"x¾". **No. 42,566 $9.99**

Science Fun & Gifts





Lapidary

Fine Lapidary Tumblers by Lortone

(A) 6 lb. Capacity: Features quiet, all–rubber 8″x4½″ barrel w/"wrap–around" gasket & patented positive sealing. Seals w/1 nut instead of usual 6 for quick inspection & grit changing. Dependable V–belt drive, nylon bearings, covered belts & pulleys, heavy–gauge steel frame, rubber feet, 4′ cord w/plug. 12″x8½″x10″. 17 lbs. 115V AC. **No. 80,096 $43.95**
Replacement Barrel w/Lid No. 70,981 13.95

(B) 3 lb. Capacity: Features heavy-duty, all rubber barrel w/gasket lid to prevent leakage, heavy–gauge steel frame, nylon bearings. 6″x8½″x6″. 4 lbs. 115 V AC. **No. 70,874 $22.95**
Replacement Barrel w/Lid No. 71,902 5.25

(C) Big 12 lb. Capacity Tumbler: Same as No. 80,096 but has two 6 lb. barrels which can be driven simultaneously. Each is 10½″x11½″x12½″. 18 lbs.
No. 80,132 $62.00 TCC

Abrasives For Rock Tumblers. Kit includes 8 oz. each of coarse, medium & fine grit plus 6 oz. of polish.
No. 70,867 $4.95

(D) Complete Rock Polishing Kit. Everything you need to get started in this interesting hobby, even the rocks! Abrasives, 3 lb. barrel w/115 V motor & jewelry findings also included. Give your jewelry that "personal touch". **No. 80,276 $49.95**

Abrasives Kit For Grinding & Polishing. Includes No. 80, 320 & 500 grit abrasives for 4–step tumbling. Cerium Oxide polish included. **No. 60,891 $14.95**

(E) Complete Lapidary Unit. Includes ¾″ turned & polished ground shaft, ¾″ ball bearings, rubber collar mounting, ⅓ horsepower motor, vise, plastic safety shield, 6″ diamond blade, 6″x1″ silicon carbide grinding wheel, 6″ sanding drum w/3 sanding belts, polishing belt, Cerium Oxide polish, dop wax & sticks, template, water valves, 6″ polishing head, instructions. 110 V AC, 7″x25″x16″. Shpg. Wt. 65 lbs.
No. 85,266 $249.95 TCC

Hard–To–Find Rocks For Tumbling

(F) 3 lb. Assortment.

Type	Description	Number	Price
Texas Agate	Patterns	41,954	$ 7.00
Mexican Amethyst	Deep Purple	41,955	11.25
Oregon Jasper	Variety	41,956	7.00
Snowflake Obsidian	Black/White	42,189	7.00

"Tumbler's Guide" by R. J. Balej. All phases of rock tumbling. 43 pp. Paperbound. **No. 9379 $1.50**

"Optical Quality" Lapidary Abrasives For Precision Grinding & Polishing

First quality abrasives for lapidary work, particularly cutting & polishing precious & semi–precious stones. Carefully graded silicon carbide: Nos. 80, 320 & 500 grit for normal 4–step tumbling with Cerium Oxide, No. 36 grit for pre–tumbling extremely rough stones. Boron Carbide (close to diamonds in hardness) for cutting & polishing gemstones, lapping tungsten carbide tools, metallurgical specimens, etc.

Grit No.	Type	Oz.	Number	Price
36	Silicon Carbide	8	41,554	$2.95
80	Silicon Carbide	8	41,551	4.95
320	Silicon Carbide	8	41,552	5.95
500	Silicon Carbide	8	41,553	6.95
Cerium Oxide Polish		6	41,575	4.50
280	Boron Carbide	2	41,555	6.95
600	Boron Carbide	2	41,556	8.95

For more abrasives, see page 18.

Special "Green Thumb" Ideas From Edmund Scientific!

Gardening and Plant Science

(G) Enhance Your Lawn Or Garden With Windmills. Working replicas of real windmills in heavy gauge steel w/durable outdoor finish. 4½′ & 8′ models have ball bearings on shaft & metal ground stakes.
17″ Desk Model (in/outuse) **No. 71,923 $14.95**
4½′, 12″ wheel dia. (14 lbs.) **No. 71,924 49.95**
8′, 22″ wheel dia. (46 lbs.) **No. 85,229 69.95 TCC**

(H) Throw-Away Razor Blade Knives are ideal for florists, wallpapering & many jobs around the house. 2″ single–edged blade saves time, trouble, money. 5″ long. Pkg. of 50. **No. P–70,369 $7.95**

(I) Plant & Water pH Tester. For quick & accurate acid/alkaline readings of plants, pool & aquarium. Range: 3.5–9 pH. Accuracy: ±2%. Self-contained, needs no batteries. High impact case, 3″x3″ electrode conditioner & instr. **No. 61,129 $19.95**
See page 36 for other pH testers.

(J) Add Oriental Charm With Dwarf Trees. Kit includes seeds for Asiatic Cypress, Temple Fan Palm, Oriental Juniper, Siberian Elm, Chinese Evergreen, Fruit–bearing Apple, Canary Island Date Palm, Far Eastern Pear, Jungle Pepper, soil, plant food, ID markers, tree pots & instr. **No. 71,017 $6.95**
How about our Bonsai book for a different approach? **"Bonsai . . . Culture and Care of Miniature Trees."** 80 pp. illus., paperbound. **No. 9444 $2.95**

(K) Grow Fresh Mushrooms At Home! Add water & crop is ready in 30 days. Continues to grow for 4–5 wks. To prevent spoilage in hot weather, we do not ship kits between April 1 & Oct. 1. Orders accepted year–round & shipped when weather permits.
Mushroom Garden (6″ dia., 5″ h) **No. 71,898 $ 6.95**
Mushroom Farm (9″x12″x9½″) **No. 71,899 12.95**

(L) Soil Test Kits . . . for science projects or your garden! Test for nitrogen, potassium & phosphorous. Color card for interpreting tests, indicator for testing pH, 4 test tubes, pH preference of common plants. Instr. **No. 60,118 $4.95**
Larger Kit. 45 tests: 15 pH, 10 ea. for nitrogen, potassium, phosphorous. **No. 70,406 $19.95**
Deluxe Kit. 90 tests: 30 pH, 20 ea. for nitrogen, phosphorous, potassium. **No. 70,405 $22.95**

(M) Make Your Own Perfume in 5 easy steps! Kit shows how to capture essential oils in useable form. You supply raw material (roses, lime, etc.), lard & undenatured ethyl alcohol. **No. 71,684 $17.95**

(N) Natural Stimulant Increases Plant Growth! Gibberellic is great for experimenting; it breaks dormancy & speeds maturity in plants, seedlings & small trees. Pump sprayer delivers 6 oz. of 0.005% Potassium Gibberellate. **Do not use on plants for human consumption.** **No. 61,173 $4.50**

Lamps That Bring Sunlight Indoors. Full–spectrum tubes give true color fidelity, better than fluorescent tubes. CRI rating of 91± (natural light is 100). Fit standard fluorescent fixtures. **Each is a pkg. of 2 tubes.**
5500° K. Recommended for cacti, orchids, bromeliads & plants requiring controlled amount of ultra–violet light.
15 W 18″ long **No. P-72,410 $15.95**
20 W 24″ long **No. P-72,409 15.95**
40 W 48″ long **No. P-83,013 15.95**
5000° K. Ideal for begonias, Cinerea, ferns, African violets & most foliage plants. Perfect for aquariums.
20 W 24″ long **No. P-72,408 $13.95**
40 W 48″ long **No. P-83,016 13.95**

Electronic Items

(A) High performance Electronic Parabolic Microphones magnify signals 100 times more than regular omni-directional mikes so you can hear a songbird or similar sounds up to ½ mile away!
Pros use them for nature recording, filming and sports telecasting. Now you can use them to shoot sound tapes, to discover the hidden sounds of nature, or to actually hear the quarterback's calls at a football game. Effective distance varies with terrain, weather & background noise.

- Sound waves reflected from the 18¾" transparent parabolic plastic shield are focused on the microphone
- Ultrasensitive moisture-sealed microphone
- Low frequency filter cuts background noise under 150 cycles
- Mike automatically cuts off during momentary loud noise
- Frequency response is 150 to 20,000 cycles
- Output impedance is 150 to 600 ohms
- Amplified output at phone jack earphones provided or pigtail cable for connection to recorder (not incl.)*
- 6 ft. cable for connection to recorder
- Uses two 9 V batteries (not incl.) **No. 1649 $299.00**

*Since there are many types of recorder plugs, the user must obtain the proper one for the recorder to operate.

Intermediate Parabolic Microphone: Same as deluxe model above but without earphones & monitoring electronic circuitry. Amplified output is fed directly to pig-tailed output cable for connection to recorder (not included). Unit is for recording use only since audible output is not provided. **No. 1665 $169.95**

A

(B) Deluxe AM Antenna . . . For Superior Reception Hear ballgames from distant cities. Tune in on your old hometown radio station. This highly sensitive AM broadcast band radio antenna gets fantastic reception. It does vary according to terrain & atmospheric conditions, but you'll be amazed at the many distant AM stations you'll receive!

- Circuits pre-amplify signal before going into radio.
- Electrical interference & overpowering stations are knocked out.
- Great antenna for areas where AM reception is marginal.
- Connect to the antenna terminals of AM set or tuner (not included) using shielded cable (incl.). Wind wire around antenna rod if set has no antenna terminals.
- Finished in textured black enamel & real teak wood. 13⅜"x9$^{1}/_{16}$"x11". Wt. 6 lb.

No. 72,263 $229.50

Highly Accurate Micro-Electronics

(C) Rechargeable Digital Frequency Meter: Ideal for radio, broadcast, ham, CB & industrial frequency testing. Features: bright 7-digit LED readout, 10 Hz to 60 MHz frequency range in 2 modes, 1 Hz & 10 Hz resolution, ±1 count accuracy, overload & overcharge protection, NiCd batteries w/115 V AC charger unit, 4 ft. coaxial input cable, complete instr.

No. 72,345 $225.00

(D) Rechargeable Digital Multimeter. Solid-state digital volt-ohm-amp meter for home, school or lab. Specifications: VDC: 1–1000 V (10M ohm/V—4 ranges; VAC: 1–1000 V (10M ohm/V)—4 ranges; DC Current: 1 mA–1A—4 ranges; Resistance: 1–10,000 K ohms—5 ranges; Accuracy: ±1% full scale DC, ±1% full scale AC, ±2% full scale Resistance; Size: 1.9"x2.7"x4", 9.2 oz. Features large 3-digit LED readout, automatic polarity, decimal & overload indication, input voltage protection in ohm & amp modes, no zero & no full scale ohm adj., 0–45°C operating temp. range, NiCd battery operation w/115 V AC charger unit. Batts. & test leads included. **No. 72,320 $159.95**

(E) Frequency Prescaler: An excellent accessory instrument that extends the range of the Digital Frequency Meter to 512 MHz. Permits measurement of UHF, TV, FM & more. Features: 20–512 MHz input range; 30 mVRMS sensitivity, 2–51.2 MHz output, BNC to BNC output cable, BNC input probe w/coaxial cable, 1 ppm accuracy. Comes complete with rechargeable NiCd battery & 115 V AC charger unit.

No. 72,346 $99.95

Low-Priced, High Performance Multimeters
Lightweight, volt-amp-ohm meters for busy technicians and hobbyists.

(F) 11 Range Multimeter—VDC: 0, 10, 50, 250, 1000 (1 K ohm/volt); VAC: 0, 10, 50, 250, 1000 (1 K ohm/volt); DC current: 0, 1, 100mA; Resistance: 0, 150 K ohm (2.5 K ohm @ center scale); Decibels: −10 to +22; Accuracy: ±3% DC, ±4% AC full scale, ±10 resistance; Size: 1⅛x2$^{3}/_{16}$ x3⅜"; battery & test leads incl. **No. 71,739 $13.95**

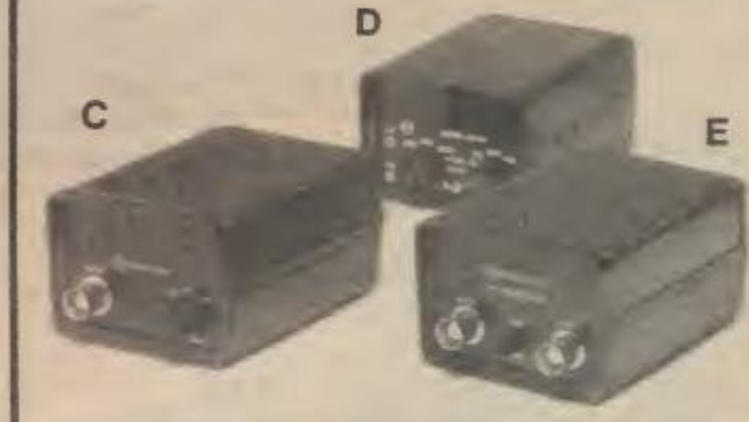
(G) 18 Range Multimeter—VDC: 0, 5, 25, 100, 500, 1000V (20 K ohm/volt); VAC: 0, 5, 25, 100, 1000V (10 K ohm/volt); DC current: 0, 50uA, 0, 5, 50, 500mA; Resistance: 0–6K–600K–6Meg–60Meg; Decibels: −20 to +62 in 5 ranges; Accuracy: ±3% DC, ±5% AC full scale; Size: 1¼x3x4⅝"; case, batteries & test leads incl.

No. 71,740 $49.95

(H) 100,000 Ohm Multimeter—VDC: 0.5, 2.5, 10, 50, 250, 500, 100V (100 K ohm/volt); VAC: 2.5, 10, 50, 250, 1000V (12.5 K ohm/volt); DC current: 10 uA, 250uA, 2.5 mA, 25 mA, 250 mA, 1A; Resistance: 0–20 K ohms, 0–200 K ohms, 0–2 Meg; 0–20 Meg; Decibels: −20 to +62; Accuracy: ±3% DC, ±5% AC full scale; Size: 4¾x2½x6¾"; batteries & test leads incl.

No. 72,239 $79.95

B



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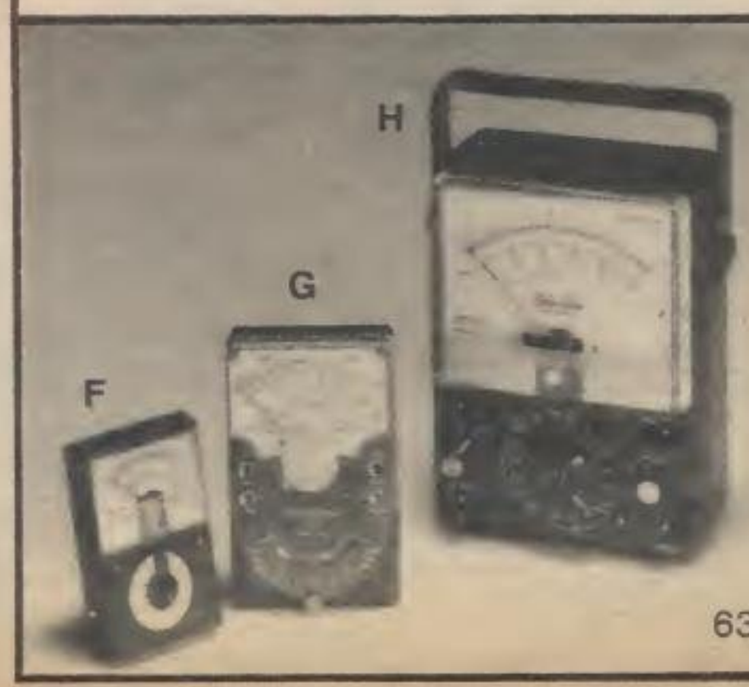


H

G

F

Tested & quality checked against rigid military standards

Cronus Electronic Timers

Official Timer at AAU, NCAA Events & At the Winter Olympic Games

- **Low battery indicator prevents inaccurate timing**
- **One master control button to start, time & finish**
- **Quartz crystal controlled accuracy to within 1 sec./yr.**
- **1/100th second readout; 60 minute timing range**

(A) Cronus Olympian . . . a single event timer Incredibly low price for such accuracy!
All the famous Cronus features listed above make the Olympian an outstanding value. Time any event from a 4 minute mile to giant slalom with better than 0.002% accuracy. No moving parts to wear out. Press the control button & 6 bright LED digits give you the time in minutes, seconds, hundredths of seconds—up to 59:59.99. Includes batteries, lanyard, 1 yr. warranty.*
No. 1694 $39.95

(B) Cronus 3S . . . with split/cumulative timing
Includes all the exclusive Cronus features above plus split/cumulative timing that provides a readout of accumulated time since the start of a connected series of events. After initial press of master control button, each subsequent press indicates total time elapsed since beginning. Also times single events. Includes batteries, lanyard, 1 yr. warranty.* **No. 1697 $79.95**
Cronus 3T. Same as above but with Taylor/sequential timing for events and actions that occur in sequence. Each press of master control indicates the time since the last press of the button. **No. 1698 $79.95**
Cronus 3ST. Combines the features of the 3S & 3T in one unit (split/cumulative & Taylor/sequential timing).
No. 1699 $99.95
Stopwatch Case for Cronus 4, 3S, 3T and 3ST.
No. 42,568 $5.95

Cronus LCD Stopwatches—In Any Event!

(C) Cronus LCD Stopwatch
King-size LCD digits are easy-to-read in both normal ambient light & brightest sunlight. Times all modes: single event, time-out, split cumulative, & Taylor-sequential. Times to 59:99.99. Also monitors 1-2 finish, count downs & automatic bounce back. Times as regular count-up stopwatch in single event or time-out mode. Built-in safety reset, 1/100th second readout, positive low battery indicator. **No. 17,002 $99.95**

(D) Cronus 4 . . . a two function stopwatch
Monitor events with time-in/time-outs. First press of master control button starts time. Second press displays time at which action was stopped. Timing resumes with next button press. Includes disposable batteries, lanyard, 1 yr. warranty.* **No. 1695 $49.95**

(E) Cronus LC-40CD Countdown Stopwatch
Counts down from either 15:00 or 05:00.00, then either automatically bounces back to 5 or 15 minutes and repeats, or counts down through zero & commences count-up to 59:59.99 with automatic rollover to 00. The choice is yours! Also times as regular count-up stopwatch in single event or time-out mode. Features safety reset, 1/100th second readout, positive low battery indicator. Case & 2 AA batteries included.
No. 17,004 $96.00

(F) Cronus LC-ST Wrist LCD Stopwatch
Easy to read under any condition with large buttons for quick operation, it features 4 timing operations: single event, time-out & split (elapsed) times or Taylor (lap) times. Measuring range: 59 minutes/59.99 seconds. Low battery indicator. Complete with case, 2 replaceable button cell batteries. Water-resistant.
No. 17,005 $95.50

(G) Cronus 1 . . . 24 hour stopwatch plus 4 timing functions
This is the finest digital stopwatch we have! It features a readout to 23 hours, 59 mintues, 59.99 seconds. The four highly accurate timing functions are: single action, split/cumulative, Taylor/sequential and time-in/time-out. Rechargeable battery & charging unit, lanyard, leather carrying case & 2 year warranty.
No. 1696 $199.00

(H) Personal Pocket Timer With Alarm
A compact (2.8x4.3x1.1"), lightweight (5 oz.) battery-operated digital timer that counts up to 9:59:59 or down to zero from whatever time you select. Enter desired time on the calculator pad, push the start button & the bright LED display counts back to zero. 2 second alarm sounds at the conclusion of the programmed-in time in the countdown mode. Use it to time speeches, debates, conferences, cooking, tests, sports events, or just about anything that requires precise monitoring. Also has time-out feature; doesn't require resetting at zero. Includes 3 "AA" batteries. **No. 1692 $69.95**

*For Warranty Information, See Page 508.

(I) NiCd Batteries & Cells

- **Rugged Nylon Cases**
- **Minimum Maintenance**
- **Vented**
- **Long Life**
- **6-32 Screw-Thread Terminals**
- **Electrolyte Supplied**

Volt	Amp-Hr.	Cells	Size	Number	Price
1.2	4	1	6x2x2½"	41,109	$ 4.50
6.0	4	5	6x2x2½"	70,942	21.00
1.2	22	1	8¼x3$^{3}/_{16}$x1$^{1}/_{16}$"	41,736	11.00
1.2	34	1	9½x3⅛x1⅛"	41,735	13.50
6.0	10	5	7x2⅜x5⅜"	70,969	47.50

(J) Portable Lighter.
Piezoelectric solid-state gas lighter gives 18,000 V spark at the push of a button. Has universal electrode, metal bracket, 9" wire, $^{3}/_{16}$-¼" spark gap, 3" capsule w/2" electrode. Capable of one million operations.
No. 42,102 $6.95

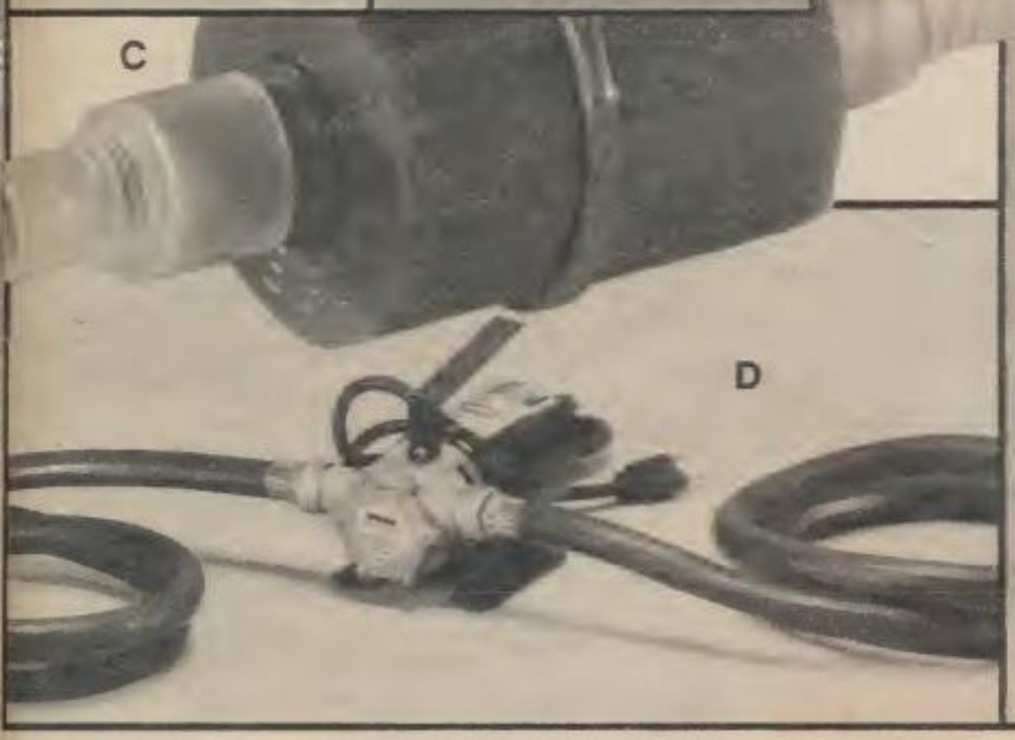
(K) Variable Output/DC Power Supply.
Output from 2-9 V DC, 200 mA rated. 0.01 V maximum ripple. **No. 71,605 $39.95**
Surplus! DC Power Supply. Input: 115 V AC; Output: 14 V DC. 0.8 amp, continuous duty, full wave solid state rectified. **No. 71,581 $4.95**

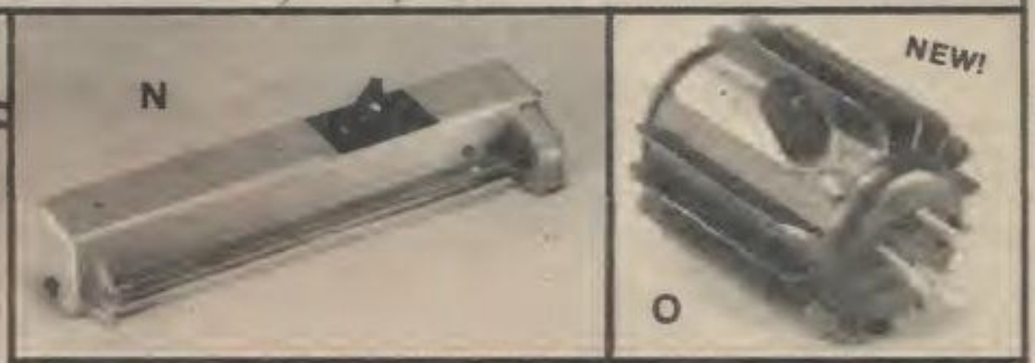
(L) 0.02 PSI Sensitive Air Pressure Switch.
Operates on difference between 2 ports and on difference between 2 sources. Single pole, normally open, 10 mA rating DC, 30 V, AC/DC. **No. 41,623 $4.50**
10 or more **3.95 ea.**

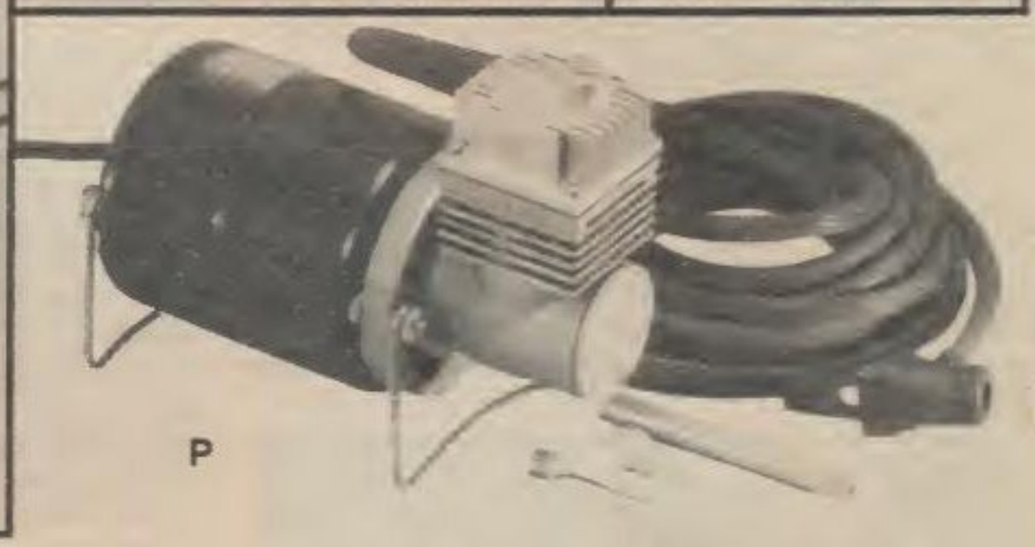
(M) Transistorized Clock Movement.
Power instruments or update a clock! Includes fit-up nut, washers, 2¾" minute hand & 1⅞" hour hand. Jeweled bearings, 1⅞"x2$^{7}/_{16}$"x3⅛".
No. 60,516 $18.95

(N) Universal Battery Eliminator.
Will operate all 6 V, 7½ V & 9 V equipment. Features quadraplug with 4 interchangeable plug tips. 9 V "clip-tip" enables it to operate items not equipped w/adapter jack. Versatile! To change polarity, rotate plug 180°. **No. 42,750 $7.95**

Motors and Pumps







(A) Vertical High Capacity Pump. Compact, general use pump. Plastic-cased, evaporative tube that pumps 300 gal/hr. 1' high. For evaporative coolers and acid & alkali pumps; no seals. 3.7 lb. psi max. 115 V AC, 60 Hz. Air cooled motor; hose adapter; removable base. Ht. $8^{13}/_{16}$"; dia. 4½". 3' cord (no plug). Wt. 2.14 lb.
No. 71,599 $15.95

(B) Miniature Pump. Perfect for photo darkrooms, science fairs, table fountains or flow models of circulatory systems. 1¾x2⅝" electric motor & pump. Pumps continuous 12" high flow (up to 1 pint/minute) through 4" tube (incl.) when base is in liquid. Use in either direction; impeller more efficient rotating counter-clockwise. Self-priming. Operates on 1½–3 V DC. Pumps liquids to a height of 24" (not a 24" high stream). Uses 2 flashlight batts. (not incl.). **No. 50,345 $3.50**

(C) Tiny Reciprocating Submersible Pump. Powerful pump operates underwater on 12 to 20 V AC. Lifts 1 pint/minute at 12" head (on 20 V). Pumps fountain-like stream over 30" high (on 20 V w/recommended $^{3}/_{64}$" nozzle). Plastic housing is 2½" long x 1" dia. 1¼ oz.
No. 60,307 $13.95

(D) Complete Liquid Handling System. Self-priming; pumps up to 350 gal./hr. Noncorrosive pump lifts water 20', pushes it 50'. For most liquids (not gasoline). Brass connections fit hose & ½" pipe. 115 V AC motor & pump, instr. **No. 71,440 $69.95**

(E) 6 Model Motors. 1.5–3 V. $^{5}/_{16}$" long shaft for attaching to pulleys.
Pkg. of 6 No. P-42,540 $3.00

(F)(G) High Torque Variable Speed Motors. Reversible gear train; low current drain; self-starting. Built-in speed reduction gears. For visual effects projectors, commercial use. $1^{13}/_{16}$"x$1^{13}/_{16}$" dia. 3 V motors have twist on battery case. Approximate operating currents: 10 mA at 3 V; 4 mA at 12 V. **Each $10.95**

Speed (rpm)	Stall Torque (in-oz)	Number (F) 12 Volt	Number (G) 3 Volt
1	65	41,860	41,327
2	31	41,331	41,861
7	12	41,863	41,862
16	5	41,865	41,864
30	2.4	41,333	41,329
115	0.8	41,867	41,866

(H) Hi-Torque Motor. Built for microcomputer cassette decks, this powerful motor is single shafted, designed for 6–12 volt operation, and runs on 0.3–20 V with stall torque of 216 in-lb. **No. 42,543 $10.95**

(I) 14 V, 3 Amp Split Series Motor. 13,500 rpm; sintered bronze bearings; steel thrust plate; ¼" dia. shaft; 16 gauge wire leads. 4" long; 1½ lb. **No. 61,085 $4.00**

(J) 12 V High Torque Motors. 1¾" dia. x 3" long; single shaft; ¼" dia. x $^{5}/_{16}$" long. Excellent for campers & auto accessories. Intermittent duty.
Pkg. of 2 No. P-42,670 $5.95

Battery Operated DC Motors

(K) 12 Hobby Motors. 1.5–4.5 V; two 13" leads; $1^{1}/_{16}$" dia. x $1^{9}/_{16}$" long; single shaft w/$^{3}/_{16}$" dia. x ¼" long gear. 9,000 rpm at 4 V DC.
Pkg. of 12 No. P-60,985 $6.00

12 Surplus 1–5 V Motors. 670 ma, 5 gr-cm load; 3950 rpm; spring steel brushes; fiber washers; brass bushings. ⅛" shafts. Each motor measures ⅞"x1¼".
Pkg. of 12 No. P-61,077 $3.95

Miniature Motor. $1^{3}/_{32}$"x1¼". Spring bronze brushes; self-aligning bronze bearings. Operates on 0.35–1.5 V. 0.078" dia. shaft extends $^{7}/_{16}$". Min. 25 mA needed to run motor. **No. 40,872 $4.95**

Reasonably Priced AC Motors

48 RPM Timing Motor. Operates on 120 V AC, draws 5 watts. Clockwise rotation; brass gear on shaft. Ideal for driving displays & animations.
Pkg. of 3 No. P-42,756 $5.50

(L) Speciality Motors. Hubs on shafts accommodate wheels w/¼" center holes. Wing nut, 6' cord & plug. Ccw rotation. 115 V, 60 Hz. *Threaded shafts.

RPM	Number	Price	RPM	Number	Price
½	60,791	$16.95	12	*60,714	$14.95
1	*60,734	12.95	30	*60,763	16.95
1	*42,558	3.00	60	*60,733	16.95
4	*42,293	12.95			

Stand for above motors. 8" high. **No. 71,118 $5.95**

(M) Hi-Torque Continuous Motor. 10 in-lb. 2 rpm motor, ccw, gear reduced. 115 V, 60 Hz. 1½ lb.
No. 42,288 $6.95

115 V Synchronous Motor. 2½"x2"; 4 rpm surplus buy! 60 Hz, 3 W. Two 6" leads. Buy 3 or more at $1.50 each & save! **No. 42,423 $1.75**

(N) Variable Speed Drive. Linear drive w/10" long worm traverse mechanism. Linear speed range from rheostat 2½-8"/minute. Operates on 2 "D" batteries (not incl.). **No. 61,192 $3.75**

(N) 115 V AC to DC Adapters. Built as rechargers for battery operated items. Ideal AC power supplies for low voltage motors. Assortment of 3 with voltages between 2.5 & 9.0 V DC. **No. P-42,653 $8.50**

(O) Motor Speed Control. Convert your fixed speed hand tools, fixtures & appliances to variable speed! Unit plugs directly into any grounded wall socket. Operates any 120 V AC/DC motor up to 6 amps, 720 watts (not intended for induction motors). An ideal accessory for shop, home or office. **No. 42,752 $14.95**

(P) Mighty 12 V DC Mini Compressor. Operates from 12 V cig. lighter outlets. Delivers 36 cu. ft/hr at 5 psi & 18 cu. ft/hr at 30 psi. Max pressure 60 psi. Safety valve set at 40 psi. Never requires lubrication. Includes cig. lighter plug, 3' cord, 10' air hose & inflater accessories. 6½"x4¾"x4¾". **No. 1628 $44.95**

Metal Detectors

Go Treasure Hunting For Fun And Profit
This exciting hobby is growing in popularity among young & old alike. Selecting a metal detector that is best for your needs depends upon where you intend to use it and for what purpose. To help in your selection, we did extensive field testing with our line of detectors & prepared the chart below. Each instrument was used to detect **(A) a dime** and **(B) a 1" steel pipe** through air, sand & water. The dime & pipe were chosen because rod-shaped objects standing on end are more difficult to detect than are objects which lie flat.

Metal Detector Depth Chart

	Air		Sand		Water		
Metal Detector	**A**	**B**	**A**	**B**	**A**	**B**	**Number**
Earth Challenger	3"	8"	2½"	8"	3"	7"	**80,262**
Deluxe Earth Challenger	4"	15"	5"	6"	3"	6"	**80,251**
Bounty Hunter I.B. 200	8"	18"	7"	18"	4"	13"	**80,233**
Wildcat VLF Discriminator	9"	19"	8"	9"	5"	14"	**80,273**
Fisher Gemini	Large items 1 ft. to 20 ft. deep						**80,202**

Types of Metal Detectors
Transmitter/Receiver—inductive balance system that indicates a "find" by a change in signal intensity. As sensitivity goes up, so does the price. Better for use in specific types of treasure.
Very Low Frequency—A TR detector that operates at a very low frequency, thus penetrating more deeply than the higher frequency waves found in some types. Super sensitive to ferrous (iron-bearing) soil.

(A) Edmund's TR Earth Challenger
We recommend this detector for the beginner who wants a fully transistorized unit that offers quality performance. It's lightweight, sensitive & well balanced. Some of its features are: a rugged blue finish, aluminum pole & electronic housing, 6" search coil waterproofed in molded ABS plastic, 9 V transistor battery that operates up to 50 hours. 2 lb., 6 oz. **No. 80,262 $39.95**

(B) Edmund's Deluxe TR Earth Challenger
Enter the world of treasure hunting in style. This transmitter/receiver detector has features & sensitivity comparable to those found in units priced well over $100.! Includes ten turn metal/mineral tuner, 6" waterproof search coil, ¼" stereo earphone jack which you plug into your own headset, 8 "AA" batteries with snap-lock battery door, adjusting telescope shaft which extends to 44". Perfectly balanced, its all metal construction is surprisingly lightweight. 2 lb., 5 oz.
No. 80,251 $79.95

Reading For Prospectors
(C) "Treasure Hunter's Manual" #7 by Karl Von Mueller. Covers details of research techniques, detector operation, legality, gold dredging & much more. Fully illustrated. 330 pp. Paperbound. **No. 9458 $6.95**

"Detector Owner's Field Manual" by Roy Lagal. Fully explains BFO, TR, VLF, VLF/TR, PRG, PI & other detector types. Tells how to select & use each type in all treasure hunting situations. Illustrated, 232 pp. Paperbound. Written by a true professional! **No. 9578 $6.95**

(D) Bounty Hunter I.B. 200 Transmitter/Receiver
This sophisticated unit has an audible signal that begins only after the rim passes over your find and then peaks directly over the find. Features wet/dry ground compensation, on/off volume control, double-shielded interconnect cable, 8" submersible search coil, 3" visual meter, earphone jack, telescoping search rod & fine tuning. Battery included. **No. 80,233 $189.95**

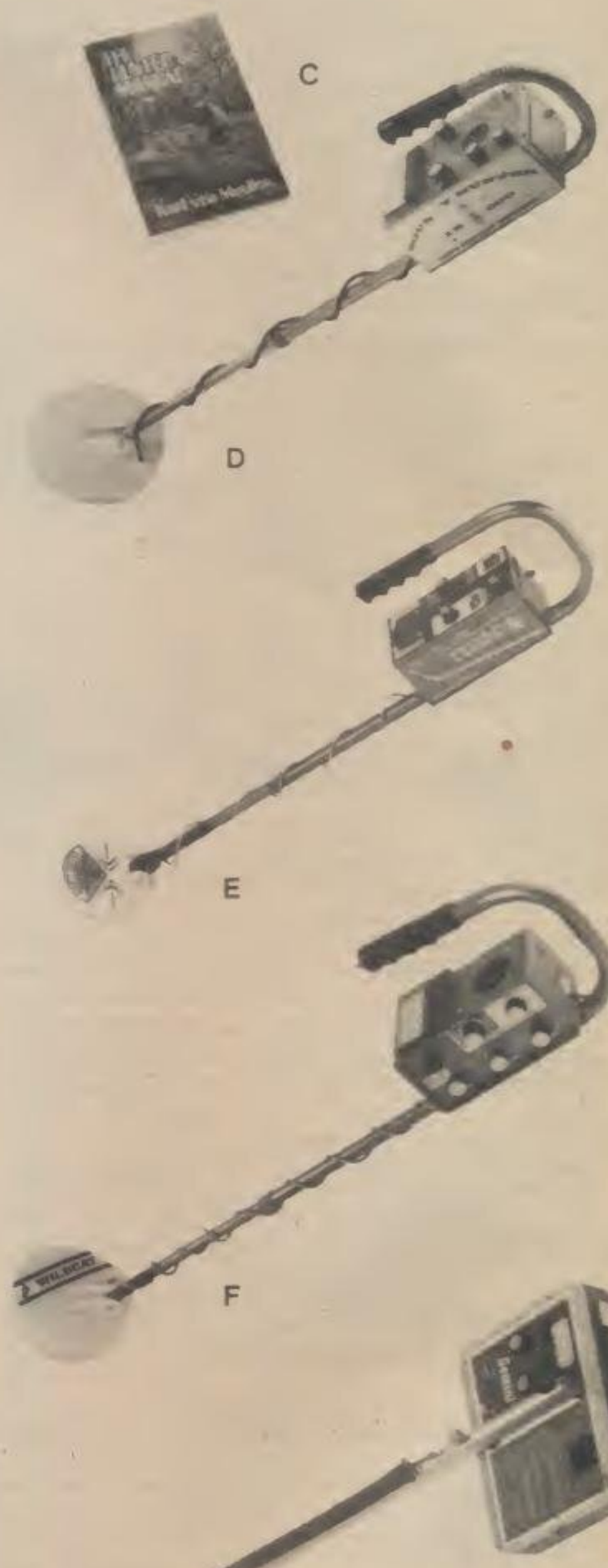
(E) Bounty Hunter T. R With "Power Saver" System
This new model utilizes the latest inductively balanced transmit/receive techniques. Provides exceptional stability & sensitivity no matter what the terrain or type of artifact you seek. Ideal for the serious "coin-shooter", it can be controlled to reject unwanted "junk". Features on/off volume control, normal & discriminate search modes, discriminate level adjust, tuning adjust, push-button re-tuning, earphone jack, telescoping search rod, adjustable search coil, "power-saver" system that allows unit to run on just three 9 V batteries. **No. 80,286 $119.95**

(F) "Wildcat" VLF Discriminator
This very fine unit offers instant tuning & true discrimination in virtually any terrain. It features a 6¼" waterproof search coil, on/off volume control, sensitivity adjuster, separate normal discriminate selector, earphone jack, 3½" intensity meter, battery tester, total rejection in discriminate, ground adjuster, recessed control panel, telescoping search rod, built-in speaker and push-button "Insta-Tune" for quick adjustments. Batteries included. **No. 80,273 $279.00**

(G) The Fisher "Gemini" Transmitter/Receiver
This unit is designed for professional treasure hunters, miners & researchers who are seeking large metal or mineral deposits. The "Gemini" is one of the most advanced instruments available. Housed in a closeable, 2-section, high-impact plastic case, it features moisture-proof solid-state circuits with superb penetration sensitivity. Includes on/off volume control, battery tester, visual meter, earphone jack, built-in speaker, power select, detachable aluminum arm, sensitivity adjuster & batteries. **No. 80,202 $349.95**
See page 50B for manufacturer's warranty.

(H) Make a "Fish Finder" with Hydrophones
Use w/both high & low impedance amplifiers & tape recorders. Rubber cased; fungus & shock resistant. Frequency response 10-6,000 Hz. reduces as depth increases. Working depth to 300'. Operating temp. to 35°C. 8" leads & instructions. Cable to surface not included. **No. 41,759 $6.00**

See our terrific selection of magnets, page 29 and 30. Magnifiers to aid your examination of your treasures, pages 44 to 48.



Fiber Optics

DuPont Crofon® Light Guides
Flexible tools for industry or hobbyist! Bend light around corners; create multiple lights from single source. Light travels in zig-zag path without attenuation. Used w/photocells, they count, detect or sort.

Complete Plastic Fiber Optics Experiment Kit. Two 2 ft. DuPont Plastic Light Guides—16 & 64 fibers. Concentrating lens, portable light source (less batts.), rubber adapter, one 5'–20 mil. & 5'–10 mil. Crofon fibers. All materials needed to polish & cap ends. Instructions incl.
No. 70,855 $19.95

Plastic Fiber Light Guides Only—Minimum order 5 ft. All jacketed in black plastic. 40% discount on quantities of 200 feet or more of one stock number, uncut!

Number	Price per ft.	O.D. of Light Guide	No. of Fibers	Minimum Radius of Bend	Fiber Dia.
2504	80¢	0.087"	16	¼"	0.010"
2522	75¢	0.087"	1	¾"	0.040"
2505	85¢	0.110"	32	⅜"	0.010"
2506	90¢	0.119"	48	½"	0.010"
2507	95¢	0.130"	64	¾"	0.010"

Plastic Fiber Optics Strands Transmit Light . . . Unjacketed strands make intriguing light-carrying devices. Available in the following diameters & lengths:

0.010 inch Fiber	200 ft.	**No. 41,212**	**$ 5.95**
	1,000 ft.	**No. 60,779**	**19.95**
0.020 inch Fiber	35 ft.	**No. 41,214**	**8.95**
	100 ft.	**No. 41,215**	**22.95**
	500 ft.	**No. 60,780**	**99.95**
0.030 inch Fiber	25 ft.	**No. 41,353**	**8.95**
	100 ft.	**No. 60,827**	**27.95**
0.040 inch Fiber	25 ft.	**No. 41,275**	**9.95**
	100 ft.	**No. 60,813**	**29.95**
	350 ft.	**No. 60,814**	**79.95**
0.056 inch Fiber	25 ft.	**No. 42,301**	**16.95**
	100 ft.	**No. 61,073**	**59.95**

Sample Kit: 20 ft. of 0.010" & 15 ft. of 0.020" unjacketed fiber; four 1 ft. jacketed light guides: 16, 32, 48 & 64 fiber. **No. 41,213 $10.95**

(A) Flexible Fiber Optics Light Guides. High-transmission, glass sheathed in plastic tubing, ground & polished ends w/metal tips. Aperture: 0.55 takes 60° cone of light. 70% light enters, 8%/ft. lost. Transmits wavelengths of 400–2,000 mu.

Number	Price	Length	F.O. Dia.	Min. Radius of Bend	No. of Fibers
40,640	$31.50	24"	1/16"	⅝"	490
42,344	34.50	36"	1/16"	⅝"	490
40,641	34.95	12"	⅛"	¾"	1470
42,345	37.50	24"	⅛"	¾"	1470
40,644	39.50	36"	⅛"	¾"	1470
40,639	44.50	12"	¼"	1½"	5880
42,346	49.50	24"	¼"	1½"	5880
42,347	54.50	36"	¼"	1½"	5880

(B) Interchangeable Fiber Optics Probes. For microscope illumination, "cold" lighting, subsurface liquid lighting, etc. Incl.: 6 interchangeable rigid fiber optic probes, 68" of flexible fiber & type S adapter for illuminator (see No. 72,162 above). Apertures of 0.027", 0.054", 0.085" & 0.118". The 0.085" has 3 configurations: straight, 45° & 90°. Hardwood case & protective inserts. **No. 61,218 $169.95**

(C) Fiber Optic Data Links Experimenter's Kit. 6 data links for less than $100 each! Many performance & cost advantages over traditional, electrical systems—no spark or fire hazard, lightweight. Includes all tools & devices needed to build 6 TT1 or CMOS compatible data links, PC boards, connectors, optic cables, semiconductor devices & materials, instructions.
No. 72,451 $595.00

(D) Deluxe Fiber Optics Illuminator: 150 W, 21 V quartz iodine lamp combines high intensity light w/low heat output. Life ranges from 200–1800 max. hrs. Produces 3250°K. Candle power 12" from each tip; 36'/candles @ 1/16" dia.; 120'/candles @ ⅛" dia.; 390'/candles @ ¼" dia. 4"x5"x9". Wt. 5 lb. **No. 72,162 $225.00**

Quick-disconnect adapters for coupling light guides to illuminator: **For ¼" dia. No. 42,343 $19.95**
1/16 & ⅛" dia. No. 42,342 19.95

(E) Flexible Fiberscope. "Sees" everywhere. Transmits through openings as small as ⅜". Coherent fiber optics. Focuses from infinity to less than ½". Field of view: @ 2"–½". Semi-rigid gooseneck sheathing.
No. 61,160 $119.88

(F) The Glass Fiber Optics Experiment Kit. 2,000 glass fibers: unjacketed 0.0025" fibers (about 600), (12) 6" plastic 0.020" fibers, 5 ft. x 0.087" coil of PVC jacketed fibers & 1 ft. light guide. Heat-shrink tips; 1½" coherent rod; 1½" glass rod; 5" polished face plate; image stone; penlight & adapter. Requires 2 "AA" batts. Instructions included. **No. 71,285 $19.95**

Glass Fiber Optics Light Guides. Only 60¢/ft. 200 (.025" dia.) noncoherently bundled in tough polyvinylchloride jacket (0.087 O.D.). 0.250" typical bend radius, temp. limits: glass −58° to +1000°F, PVC jacket −58° to +220°F. When polished & capped, will transmit light from 400 to 2000 mu as follows: @ 1 ft. 65%, @ 4 ft. 55%, @ 6 ft. 45%, @ 12 ft. 20%.
Minimum order 10 feet. No. 2516 60¢/ft.
Quantity prices available on 1,000 ft. or more!
Capping solution. 1 dram bottle. **No. 61,090 $2.95**
Transparent Epoxy Cement. No. P-40,674 1.95

(G) The Edmund Deluxe Fiber Scope. Coherent fiber optics to transmit coherent image! Portable w/self-contained, cool light source. Snakes through complex bends. Can pass through port slightly larger than 0.312" I.D. Incl. 2 "C" batts., light bulbs, case & right angle attachment. **No. 1666 $495.00**

(H) Flexilight Illuminates Inaccessible Areas. 2' long, vinyl cased, 64-fiber flexible plastic guide snakes around corners—through small holes. 0.130" O.D.; min. bending radius ¾"; 0.004 sq. in. of light surface. Incl.: chrome finish penlight (5½"x⅝" dia.), bulb, rubber adapter, instr. & 2 "AA" batts. **No. 60,648 $4.95**
Penlight & batts. only. No. 40,900 2.95

10X Hastings Triplet Magnifier. For details see page 44.

"Fiber Optics Idea" Booklet. Includes many design & application ideas. **No. 9095 $2.25**

Image Conduit: 71,000 (0.0005" dia.) fibers fused together forms a ⅛" rod that transmits a coherent image. Use Bunsen burner to bend into complex shapes. Resolution is 80 lines per mm.
6" Length No. 40,642 $18.95
12" Length No. 40,643 29.50

New DuPont Optical Fibers. Compatible w/AMP connectors, EMI, RFI & Ground loop immunity. Attenuation: 40 db/km @ 775 nm. Highly flexible, ideal for computer data transmission. PIFAX™-P, plastic core, ¼ attenuation of conventional cables—ideal for run lengths up to 100 m. PIFAX™-S, silica cores, for run lengths up to 1 km. Excellent resistance.

O.D."	DuPont Type	Number	Price per Ft.
0.095	PIFAX™-S120R	**2523**	**$2.25**
0.105x0.165*	PIFAX™-S220R	**2524**	**3.95**
0.075	PIFAX™-P140R	**2525**	**1.50**

*Dual Channel Cable

Fiber Optic Ribbon & Sheeting. Flexible, paper-thin, coherent sheet of 2–3 mil glass fibers adhesive-bonded, approx. 400/inch. Instructions included.
Ribbon (1x12" long) No. 41,225 $ 21.00
Sheeting (9x12" long) No. 60,795 175.00

Battery Operated Lite Inspection Set. Includes 6" Lite conductor, 4" with 24° curve. 15/16" clip-on mirror. For inspecting recessed cavities & tubes. Lightweight aluminum handle, light pipes, pocket-size, case. 2 pen-lite batts. (not incl.). **No. 42,682 $12.95**

Light

(A) Spectrum Power Supply
- Delivers voltage needed to light spectrum tubes
- Includes integral stand to hold tubes
- Transformer: specially designed 5000 V, 7 milliamp current, on/off switch
- Cord: heavy duty 3-conductor 6 ft.

Size: 3⅛ x 6¼ x 21". **No. 71,559 $79.95**

(B) Spectroscope
Sturdy, table-top model for schools, labs & industry. A diffraction grating instrument equipped with a scale to show approx. wavelengths in Angstroms. Housed in a single-piece aluminum casting mounted on a nickel plated steel post & supported on strong cast iron base. Easy for students to use, it has a white-faced adj. reflector that is positioned to give a small amount of backlighting to a photographic film scale, making the scale clearly visible against the spectrum. The spectroscope will detect Ca, Pa, Sr, Li, K, Na, Rb, Cu, etc. by flame emission. To observe the solar spectrum, use a cloud and the adjustable slit. As slit is closed, the more prominent vertical Fraunhofer lines appear. To view spectra in the lab., the source is placed in front of the slit & the adj. reflector is arranged so light from an incandescent lamp is directed in the scale to sufficiently illuminate it. The conventional method of heating salt solutions works exceptionally well with this instrument. 16"x10"x8", Wt. 7 lb. **No. 72,411 $149.95**

Compact UV Lamps . . . With Accessories
Low-pressure, mercury discharge lamps with all the correct accessories. They're convenient, intense, UV sources for many uses including calibration of spectrophotometers, inspection and other uses. Long (366 nm) and short (253.7 nm) wave types; with 15' cord, plug (see Power Supply) provides the necessary 800 V starting and 200 V operating voltages.

Quartz Pencil Lamps (short wave). Intensity 42 uW/cm² of 253.7 nm light at 12" (420 uw at 1"). Each approximately 2 oz.

Lamp (C) 2⅛ x ¼" O.D. Overall 5" long, including ½" dia. handle. Choice of shield A, B, or C. **Each $59.50**
A. (1 mm dia. ap.) point emission. **No. 40,758**
B. (3/16x5/8" ap.) interferometry. **No. 40,759**
C. (3/16x1½" ap.) spectrophotometry. **No. 40,760**

Lamp (D) ½"x¼" O.D. Overall 3" long, including ½" dia. handle. **No. 40,757 $59.50**

Lamp (E) Ultraviolet Lamp (Long Wave). Has filter that minimizes visible light. **No. 40,765 $81.50**

(F) Power Supply. 5½"x2¼"x3", 3 ft. secondary cord, and 8-ft. primary cord: 115 V. 50/60 Hz. 36 W. Wt. 4 lb. **No. 70, 298 $74.95**

(G) Hand Held Spectroscope
- Determine relative light frequency emissions
- Palm-sized 4 13/16" stainless steel
- Variable slit for precise image definition
- Adjustable focus. **No. 42,586 $69.95**

(H) Power Supply & Adapter . . . For pin-style lamps
- Lamp power select dial • Operates all Osram Lamps
- Includes medium pre-focus socket lamp holder
- Shield & wide scale meter 115 VAC, 50/60 Hz, 7.5 Amps

Wt. 30 lbs. **No. 85,239 $299.50 T.C.C.**
9-pin adapter only No. 41, 283 $59.95

(I) Precision Adjustable Optical Slit. New Design From Edmund Scientific! Here is a new high quality optical slit of micrometer precision. Basic use in high-level spectroscopy where an extremely accurate adjustable slit is required . . . both jaws move equally & stay completely parallel. Slit height: 1 cm. Opens equally from center, maintaining the same optical axis at all adjustments. Black with stainless steel; tube dia. 23.9 mm. tube 28 mm long. Jaws have 0–6 mm usable opening. **No. 40,488 $395.00**

(J) Line Spectrum & Monochromatic Light Sources . . . High Energy, Constancy & Excellent Spectral Purity
Line Spectral Lamps by Osram
- Measures 102 mm high x 21 mm O.D.
- 9 pin DIN base (requires adapter for power supply—included in No. 85,239, also offered separately)
- Glass outer bulb lights emit line spectra
- Light center length—43 ±1 mm center of arc to bottom of base with no readjustment during operation.

Description	Burner	Number	Price
Cadmium (Cd)	Quartz	41,245	$ 99.50
Cesium (Cs)	Glass	41,244	139.50
Helium (He)	Glass	41,243	99.50
Mercury (Hg 10)	Quartz	41,242	99.50
Mercury Sulfide	Quartz	50,065	29.75
Merc. (Hg. 12) U.V.	Quartz	41,241	59.50
Merc. (Hg 13) U.V.	Quartz	41,240*	139.50
Potassium (K)	Glass	41,238	139.50
Sodium (Na)	Glass	41,237	109.50
Neon (Ne)	Glass	41,236	129.50
Rubidium (Rb)	Glass	41,235	139.50
Thallium (Ti)	Quartz	41,234	99.50
Zinc (Zn)	Quartz	41,233	59.50

*Outer envelope window permits short wave radiation.

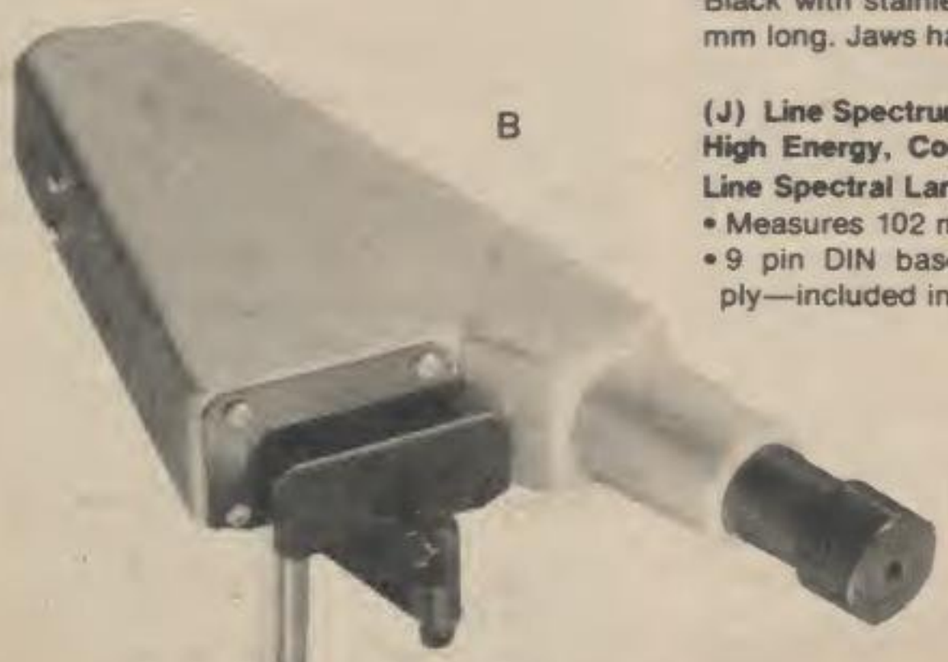
(K) Incandescent Replacement Lamp
For instruments, lighted radio dials & OEM applications, 6.3 V., 0.36 amp clear incandescent lamp, 0.41" diameter; copper leads ⅜" long; 0.75 candle power. **Pkg. of 5. No. P-42,608 $2.50**

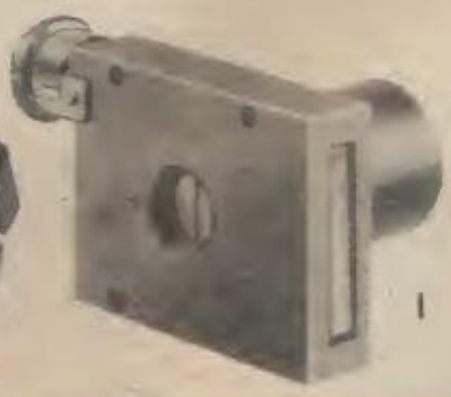
(L) Low Cost Spectrum Tubes. Plucker Tubes for wavelength determination with a grating spectrometer.
- For spectrum analysis by comparison method
- Acquaints students with spectra of gases: shows characteristic color of gas in pure form.
- Tubes operate on induction coils & low current transformers of 2500 V and up.
- 10 cm long (approx) capillary tubes with an electrode sealed in each end. **Each $9.95**

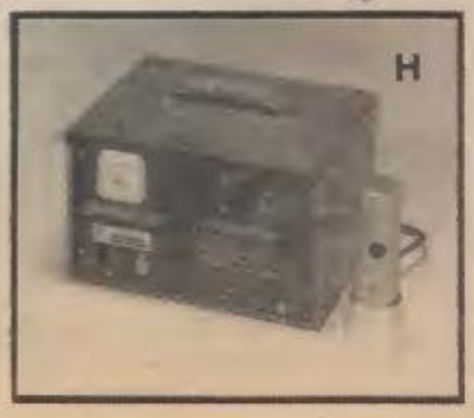
Hydrogen	No. 60,906	Nitrogen	No. 60,911
Helium	No. 60,907	Neon	No. 60,910
Oxygen	No. 60,912	Water Vapor	No. 60,913
Argon	No. 60,909	Carbon Diox.	No. 60,914

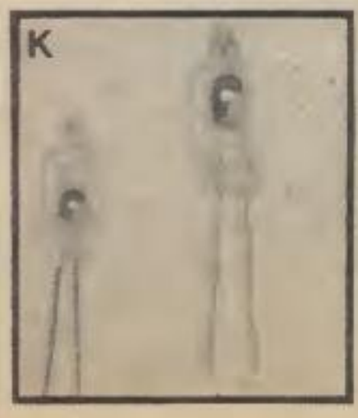
Krypton	No. 60,915	$11.95
Xenon	No. 60,916	15.95
Mercury Vapor	No. 60,908	10.95

Long Wave & Short Wave Ultraviolet Unit
Dual wavelength lamp with complete one-hand operation. Each has its own switch for independent operation. Includes separate filters for peak transmission at proper wavelengths with visible light transmission. 115 V AC; portable when used with batt. adapter case (reqs. 2 "B" batts.). Shortwave: 2537 A; long wave: 3660 A. Includes 60 pp. booklet. **No. 70,259 $79.95**
Battery Adapter Case No. 70,260 34.95









Diffraction Grating

What Is A Diffraction Grating?
A diffraction grating is a plane surface which contains thousands of parallel microscopic grooves. It breaks up white light into the component colors of the spectrum. This phenomenon is called "diffraction". Because of the difficulty involved in fabricating the grooves, original gratings are very rare & expensive. Replicas are available in many sizes and cost about $5.00/square inch. We offer two types of attractive diffraction grating film replicas at very low prices. Each type has 13,400 grooves per lineal inch and is 8½" wide (7½" grooved) x 0.005" thick. Dispersion of light is 24°.

The Two Types offered are:
(A) Transmission (see through clear film)
(B) Reflection (thin aluminum coating)

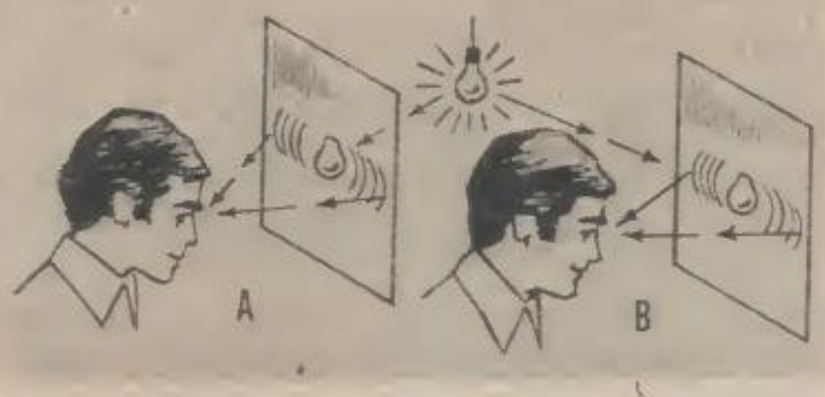
Uses of Diffraction Grating
Decoration: Tape transmission type on window; sun creates beautiful rainbow spectral effects through grating. Sandwich between glass or plastic for wall panels, table tops, skylights or signs. "Diffraction Grating Idea Book" below contains many ideas.
Photographic: Transmission type in front of lens creates unusual rainbow effects.

Other Ideas For Diffraction Grating Sheets
Teaching: Great for physics class demonstrations, give one to each student. Fine for science fair projects, homemade spectroscopes & art classes.
Industrial: Use in displays, packaging or meterology. Test microscope resolving power.

Create a Rainbow of Color When Making Jewelry Displays or Other Decorative Items
(A) Diffraction Art Foil. One aluminized side embossed with fine, concentric lines (14,000/in.) breaks up light & reflects many rainbows. Roll or self-adhesive sheets for decorating signs, displays or plaques.

Sheets (6"x6")	**No. 41,358**	**$ 2.95**
10 Ft. Roll (6" wide)	**No. 60,830**	**11.00**

Experimenter's And Designer's Kit. Includes two 8½"x8½" sheets (one transmission, one reflection grating), four assorted self-adhesive, circular-patterned gratings, double-faced tape strip, two 1" dia. pieces of mounting glass, one 2"x2" card viewer for each grating and Edmund's "Idea Book". **No. 70,563 $6.95**



Card-Mounted Diffraction Viewers
Transmission Type in 2 x 2" Mounts. These have one square inch of diffraction grating exposed.

No. 40,272	One slide only	**$ .50**
No. P-30,282	Forty in plastic container	**6.95**
No. P-50,183	One hundred in container	**15.95**

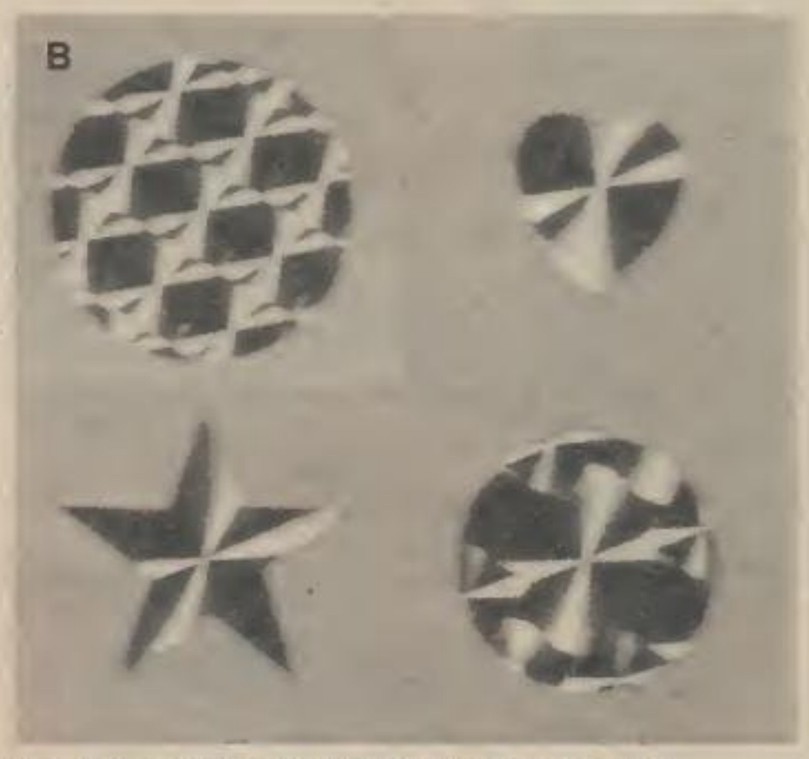
Sheets and Rolls of Grating All 8½" Wide

	Transmission Number	Price	Reflection Number	Price
8½x11 sheet	40,267*	$ 2.95	50,201*	$ 3.95
6-Ft. Roll	50,180	8.95	50,203	12.95
25-Ft. Roll	70,565	32.95	70,566	49.95
100-Ft. Roll	70,567	99.95	70,568	139.95

Combination. Two 5½x8½" sheets, one each-transmission & reflection grating. **No. 50,202* $3.95**
*Includes 1 page idea sheet

Instrument Quality Concave Grating
Low-cost replica glass grating suitable for serious instrumental use. Ground & polished optical surface, aluminum coated, 15,000 lines/inch. Reflects ultraviolet light. Concave, can be used in uncollimated light. 3" diameter x ⅜" thick. Ruled area 1½" x 1½". Blaze wavelength 4,000 A°. Radius 100 cm.
No. 50,220 $125.00

1,000 Lines Per Inch Metalized Grating
This high quality 1,000 lpi metalized grating (Ronchi ruling) comes in 2"x2"x0.075" glass slides. It has many uses, especially for metrology, microscopy & infrared spectroscopy. Contains a 50-50 ratio of black & clear parallel lines with a specification of one line per 0.001".
No. 30,609 $69.00



The Edmund "Diffraction Grating Idea Book"
Learn about diffraction gratings and how to use them in decorations, displays, photographs and more! Many illustrations. Paperbound. **No. 9064 $1.95**

(B) Diffraction Skin Jewels—Self Adhesive. They break up light into rainbow colors. Sales personnel use them as "door openers"—children and adults enjoy them. Place on skin or clothing. Colors change with movement. 2 each of six shapes. Pkg. of 12.
No. 41,294 $2.95

Instrument Quality Diffraction Gratings For Research & Science Precision low-cost plane reflection grating replicas . . . 15,000 & 30,000 Grooves per Inch.
Well blazed and suited for use in monochromators and other instruments. Replicas on aluminized glass blanks, reproduced from extremely high-quality, imported masters which were ruled on an interferometrically controlled ruling engine. Ideal for use by instrument makers, labs, students and schools.

Approximately 15,000 (600/mm) Grooves Per Inch Blaze Wavelength is 4,000 A°

Number	Size Inches	Groove Length	Ruled Width	Price
41,021	½" x 1"	½"	1"	$27.95
41,019	1" x 1"	1"	1"	37.50
41,016	2" x 2"	2"	2"	59.95
41,013	4" x 4"	4"	4"	137.50

Approximately 15,000 (600/mm) Grooves Per Inch, Blaze Wavelength of 5,000 A°

Number	Size Inches	Groove Length	Ruled Width	Price
41,030	½" x 1"	½"	1"	$ 27.95
41,028	1" x 1"	1"	1"	37.50
41,025	2" x 2"	2"	2"	59.95
41,022	4" x 4"	4"	4"	137.50

Approximately 30,000 (1200/mm) Grooves Per Inch, Blaze Wavelength of 2400 A°

41,039	½" x 1"	½"	1"	$ 37.50
41,037	1" x 1"	1"	1"	49.50
41,034	2" x 2"	2"	2"	71.50
41,031	4" x 4"	4"	4"	205.00

Approximately 30,000 (1200/mm) Grooves Per Inch, Blaze Wavelength of 4,000 A°

41,048	½" x 1"	½"	1"	$ 37.50
41,046	1" x 1"	1"	1"	49.50
41,043	2" x 2"	2"	2"	71.50
41,040	4" x 4"	4"	4"	205.00

Prices Slashed on Quantity Buys!
Aluminized Glass Mounted Replicas
These replicas on aluminized glass blanks did not make our high quality instrument gratings because of cosmetic defects. Therefore, we sell them at exceptionally low prices. Their slight chips, scratches or similar imperfections should not affect the working area. We're sorry, however, that at these prices we cannot promise specific lines/mm or blaze. We can select the size of the grating. All are in the visible light range with either 600 or 1200 lines/mm. Blaze wavelength varies between 2,500–5,000 A°. Buy in quantity & save even more!

½" x 1"	**No. 42,284**	**$ 4.95**	3 or more $4.00 ea.
1" x 1"	**No. 42,285**	**7.95**	3 or more 6.50 ea.

Skin Jewels make great premiums. See page 88

Infrared Products

(A) Intense 10,000 or 5,000 Lumen Spotlights Or Floods

***Rated Life 2,000 Hours**

Tungsten halogen lamps—most powerful filament type. Operate in any position! Retain 97% of initial brightness throughout their long life. Excellent indoors or out for spotlights, flood lamps or general use. Feature self-cleaning iodine cycle & tapered screw base for accurate optical alignment. Use with socket or adapter below. Quartz envelope provides resistance to thermal shock. Internally fused. Color temp. approx. 3,000°K. For 120 V AC/DC. Specifications included.

500 w 10,000 lumens 3⅝x½"	**No. 40,779**	**$21.95**
250 w 5,000 lumens 3x½"	**No. 40,780**	**18.95**
Socket for above lamps	**No. 40,781**	**4.75**

Adapter to use above lamps in regular light fixtures. **No. 41,186 $13.95**

(B) 40-Watt Infrared Illuminator

115 V AC light source transmits infrared light of between 780 & 1400 nm. Use indoors or out. Includes adj. fixture, special I.R. filter, wall/camera mt. 8,000 hr. bulb. Wt. 4 lbs. Requires wiring. **No. 72,094 $49.95**

(C) See In Total Darkness With M3 Sniperscope

Surplus Army IR scope built by RCA & used in surveillance, nature study & mineralogy. Operates on 6 V car batt. or rechargeable NiCd batt. (see pg. 64). 16¾" long telescope with 50.4 mm dia. lens has 5" dia. filter, electrostatically adj. focus, vertical & horizontal reticle intensity adjust knob, pistol-grip handle w/switch control, strap & case. Power pack (batt. not incl.) has 6 V input, 20,000 V output. Instr. **No. 85,157 $395.00 TCC**

NB: Not available to California residents other than for the authorized use by the U.S. Armed Forces or law enforcement officers, or for use solely for scientific research or educational purposes.

Dichroic Filters For High Color Saturation.

Thin interference filters on 2x2x1/16" glass. Experiment at various angles; watch them change color as they block out certain wavelengths of light. Use in a projector's slide gate to produce "purer" colored light.

Red	**No. 30,634**	**Blue**	**No. 30,635**
Green	**No. 30,636**	**Yellow**	**No. 30,637**

$5.95 Each.

Surplus Dichroic Filters. 69x97 mm, 1.6 mm thick. When used at 45° to incident beam as intended, provides approx. 2½" "window". Red filter (by reflection) effectively reflects away longer red wavelengths & can be used as heat filter. Yellow (by transmission) is standard dichroic as above. Sorry, other colors not available. Slight coating flaws at perimeter.

Red Dichroic Filter	**No. 42,839**	**$4.25**
Yellow Dichroic Filter	**No. 42,840**	**4.25**

Infrared Filter For Photo Light Sources, Sniperscopes, Signaling & Alarm Systems

Glass filter w/coating on 1 surface. So little visible light passes through in total darkness that it's undetectable from 20 ft. (even when looking directly at light). 5⅜x⅛" thick. Gov't. surplus. **No. 60,033 $4.95**

Bargain I.R. Filter—great for making a darkroom safelight or as an I.R. light source. Plastic 4x4¼x⅛". Pkg. of 2 **No. 42,299 $2.00**

I.R. Filter Makes Your Flashlight Infrared

43.6 mm dia. x 2.8 mm thick, it fits standard flashlights. Makes handy, low-cost I.R. light source. Gov't cost is $5. **No. 42,143 $2.00**

"Applied Infrared Photography" Discusses recording infrared images. 92 pp, 8½x11". Paperbound. **No. 9104 $4.50**

Polarizing Material

What is Polarized Light?

Light coming from a bulb vibrates in all directions perpendicular to the light ray. A polarizer, or a piece of polarizing material, placed in the path of a light beam, acts like Venetian blind slots which permit the light to vibrate in only the direction to pass (see Figure A). This light is said to be plane polarized. By placing a second piece of polarizing material, an analyzer, in the path of plane polarized light with its axis (Venetian blind slots) at right angles to the first polarizer, very little light will be transmitted (see Figure B). Turning either the polarizer or the analyzer away from the crossed axis position permits more or less light to be transmitted. This is one of the ways to make variable density filters.

Selected Seconds . . . Bargain Prices . . . Limited Supply.

Rigid, Sandwich Type Polarizers.

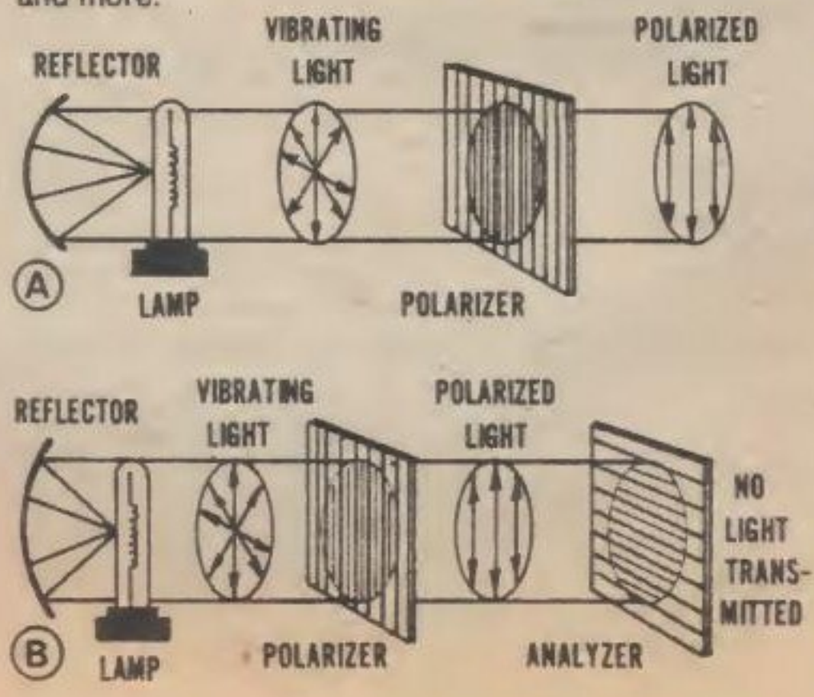
Manufacturers in optical industry reject entire sheets of polarizing material for even a minute defect. These rejects are offered at a fraction of their normal price!

Number	Price	Size	No. of Sheets
70,887	$ 6.75	7x24"	1
P-70,888	10.50	7x24"	2
P-70,889	39.95	7x24"	10
P-60,638	4.75	6" dia.	2 discs
P-40,990	2.95	3¼"	2 discs

Only minor imperfections! Sandwiched between two sheets of plastic, the polarizer is rigid, but cut easily with scissors to give 0.030" thick filters. Transmission approx. 30% for single sheet & 22% for 2 sheets placed together with axes parallel on top of each other. When crossed, transmission falls to 1%. Resist fading & delamination. Excellent as photo light filters, polariscopes no-glare camera filters & in microscopy.

Broad Application Polarizers

Intended for use in eyeglasses, airplane cockpit windshields, and for many other optical uses, this sheet polarizing material was rejected because of only slight imperfections. Edmund now offers it to you at bargain prices for experimenting, photography, microscopy, unique lighting effects, advertising displays, teaching and more.



Pkg. of 3 sheets (9x22")	No. P-72,219	$6.00
3 or more packages		$5.00 per pkg.

Small, Round Filters Mounted Between Glass

Number	Price	Dia.	Thick.	Trans.	
30,529	$ .60	16.5 mm	3.5 mm	20%	
633*	.75	20 mm	2 mm	20%	2 in Pkg.
40,209	2.50	47 mm	2 mm	35%	

*One cover glass is neutral filter.

14x24" Polarizing Sheets.

Exceptionally high quality, originally used for sunglasses. Each sheet is a factory second with only minute imperfections. 14x24" sheets are only 0.003" thk. & can be easily cut with scissors. Transmission: 23–25%; polarizing efficiency over 99%. Resistant to fading & delamination. Use material for large photo light filters, teaching microscopy, etc.

Number	Price	Color	No. Sheets
71,939	$ 9.95	Gray	1
P-71,940	18.95	Gray	2
P-71,941	69.95	Gray	10
71,942	9.95	Brown	1
P-71,943	18.95	Brown	2
P-71,944	69.95	Brown	10

2 x 2" Polarizing Filters

Experiment with polarized light and make polarized color patterns. Light transmission about 40%. Plastic, 0.03" thick. Pkg. of 20. **No. P-41,168 $3.50**

OEM & Instrument Components

OEM And Instrument Components

For over three decades, Edmund Scientific has been a leader in the design & manufacture of innovative scientific products . . . Now Edmund offers cost-saving optical & mechanical equipment components in quantity on an OEM basis. Manufacturers engaged in optical product design & assembly can now minimize their tooling investment by purchasing components normally available in only large lots. (Larger quantity pricing is also available by contacting our National Sales Department.) Many of our OEM components are ideally suited for prototypes & bench trials, others for direct incorporation into production assemblies. If you have a need for hard-to-find components, read through our catalog . . . we probably have what you're looking for.

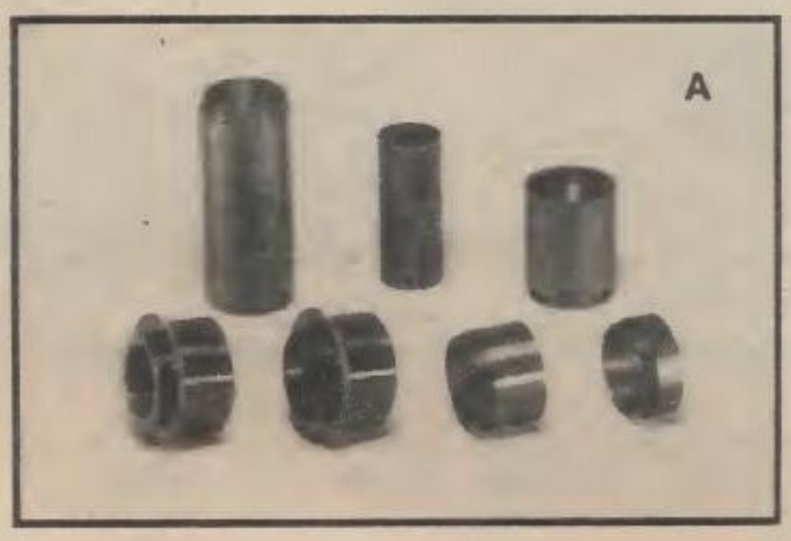
Only a few types of components are listed below to illustrate the range of items available. There are many more on the following pages.

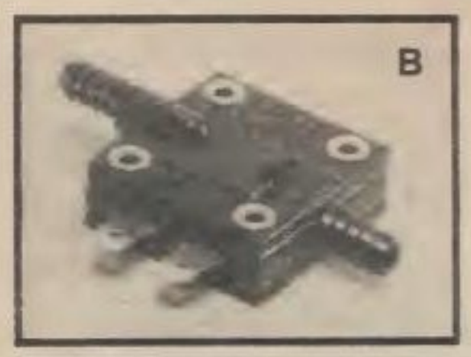
Components Listed Elsewhere In This Catalog:

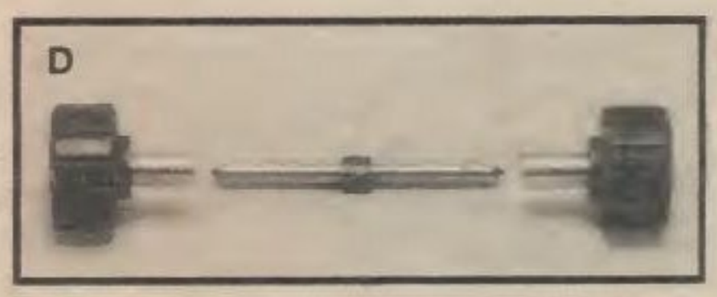
Item	Page	Item	Page
Eyepieces	11, 15, 16	**Mirrors**	78, 79
Prisms	77	**Fiber Optics**	67
Beam Splitters	79	**Lenses**	74–76
Prism Diagonals	14	**Fresnel Lenses**	76
Projection Lenses	26	**Camera Lenses**	26

(A) Astrophoto System Adapter Kit . . .
Includes: 2 adapters—1 "T" to 2" eyepiece adapter (full bore) for objective projection and 1 "T" to 1¼" I.D., 2" O.D. eyepiece adapter for ocular projection; 4 extension tubes (12.5, 25, 50, & 100 mm length) to permit magnification changes when using objective projection; a short housing for Barlow lens cells; 36 page book "Photography With Your Telescope"; and complete instructions. **No. 72,063* $69.95**

2" O.D. to "T" Mount Adapter bored for 1¼" eyepiece.
No. 42,258 $15.95
12.5 mm Extension Tube only No. 42,259 12.95
25 mm Extension Tube only No. 42,260 12.95
50 mm Extension Tube only No. 42,261 15.95
100 mm Extension Tube only No. 42,262 15.95
*This kit requires the use of a "T" adapter ring to couple your 35 mm camera to included T-mount adapter. See T-compatible adapters on page 27.







(B) Sensitive Air Pressure Switch.
Operates on pressure difference between 2 ports. Only 0.02 psi air or ½" water pressure needed. Single pole, normally open. 10 mA DC rating. 30 V AC/DC.
No. 41,623 $4.50
10 or more $3.95 each.

Microscope Focusing Mounts
- High quality rack and pinion
- Conform to international standards
- Precision plated brass helical rack
- Steel pinion focusing (70 mm travel)
- Flat brass base, easily drilled and tapped for mounting
- Accepts 0.917" dia. eyepiece.

(C) Fine/Coarse Focusing Tube: 3 mm fine focusing travel; 6¼" long x 3 3/16" high x 3 1/16" wide. Wt. 2.8 lb.
No. 71,525 $229.95

Coarse Focusing Tube: not shown (similar to C) 6¼" long x 2¾" high x 2¾" max. width. Wt. 1.4 lb.
No. 71,524 $169.95

(D) Focuser Components
Helical Gear Shaft. 1 piece steel shaft and helical gear; brass bushings; 14 teeth per inch; face 0.236"; pressure angle 14.5°; pitch 14; shaft diameter 0.177"; length 2⅜"; gear O.D. 0.275". **No. 40,197 $7.95**
Helical Rack. Brass, meshes with above gear.
Length 4" No. 40,196 $3.95
Length 11¾" No. 40,195 9.95
Brass Gear Shaft With Knobs. Dia. ¼"; 10 teeth/inch; pitch 48; 2" long. Knobs, ⅞" dia., fits ends; lock with set screw. **No. 40,164 $1.95**
Brass Racks. Brass, meshes with gear shaft above.
Length 4" No. 40,060 $1.95
Length 6" No. 40,054 2.95
Length 12" No. 40,053 5.95

NEW!

"The Exploratorium Cookbook". A Book of Demonstration Ideas. Complete with diagrams, illustrations & explanations, it is filled with recipes for building 82 exhibits. An unusual & practical investigation into exhibits utilizing mechanics, perception, polarization, electricity, magnetism and more. Each exhibit includes description, construction, critique & speculation. Ideal for school projects, museum displays & display people. An excellent companion to "Vision: In the Eye of the Beholder" on page 92. **No. 9577 $49.95**

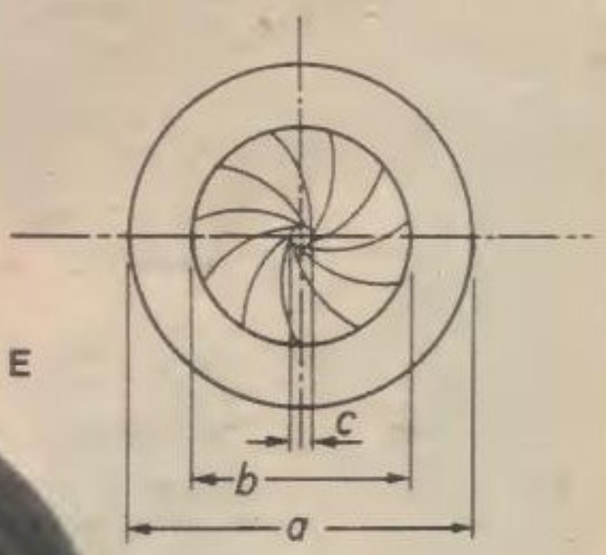
(E) Precision Iris Diaphragms

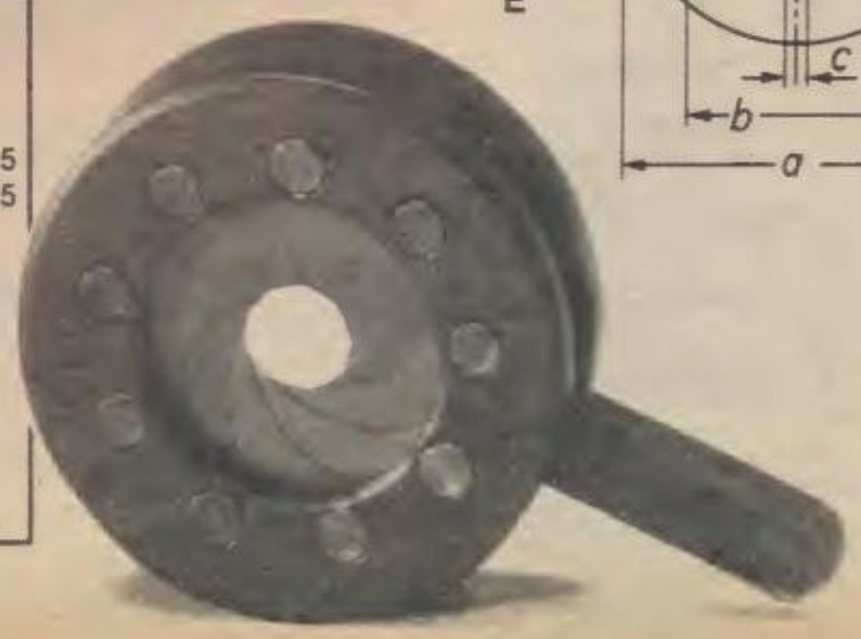
• From Germany & England **• Large Selection**

By locating three reliable sources, we have a continuing supply of these diaphragms for large volume applications. These are fine quality iris diaphragms designed for instrument use. They are built with lever-operated iris leaves made of blued spring steel (except No. 72,439) in lightweight aluminum mounts. All offer exceptionally smooth operation.

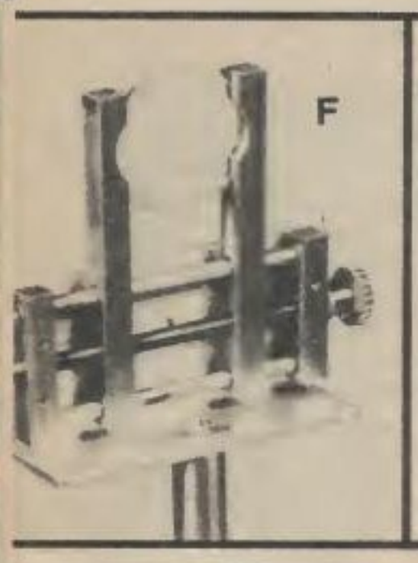
Number	Price	Outside Dia.(a)	Aperture Max.(b)	Aperture Min.(c)	Thick (d)	Comments
42,124*	**$14.50**	15.5	8.5	1.0	7.0	Lever, 8mm
30,263	**10.95**	19.5	12.0	1.0	5.0	Lever, 14
42,123*	**16.00**	22.0	14.0	1.0	5.5	Lever, 12
42,122	**19.90**	40.0	27.0	1.2	6.5	Lever, 11
40,997	**14.95**	42.5	25.0	1.0	8.5	Outside thrds. 27.8; Filter holder; Lever, 20.5
40,998	**15.95**	48.0	30.0	1.0	12.5	Outside thrds. 33.9; Filter holder; Lever, 20.5
41,972*	**19.50**	48.0	34.0	2.5	10.0	Lever, 2mm
42,121	**16.70**	48.5	30.0	1.2	7.5	Lever, 10mm
41,973*	**21.50**	56.0	41.0	3.5	11.8	Inside thrds. 50; Lever, 2
30,118	**19.95**	58.0	42.0	2.0	6.5	Lever, 13.0
30,264	**44.50**	100.0	75.0	7.0	9.0	Lever, 13.5
60,644*	**55.00**	150.0	110.0	7.0	13.0	Lever, 30.0
70,894	**139.50**	181.5	150.0	10.0	6.0	Lever, 31
70,895	**169.50**	300.5	225.0	9.9	19.0	Lever
72,439**	**265.00**	502.0	375.0	48.0	80.0	

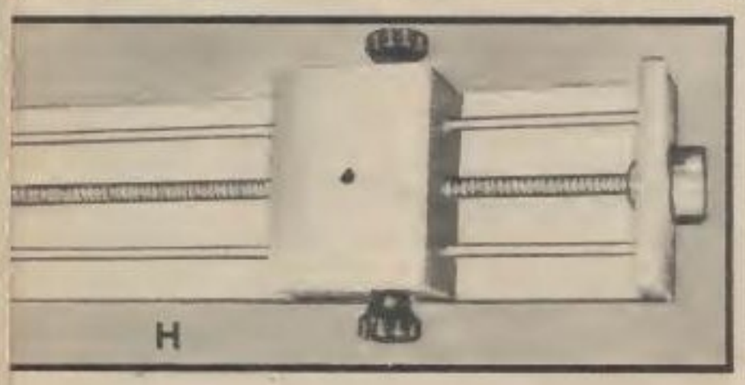
*Large quantities in stock. **Note: Dimensions in mm.**
**Stainless Steel leaves rotating knob control

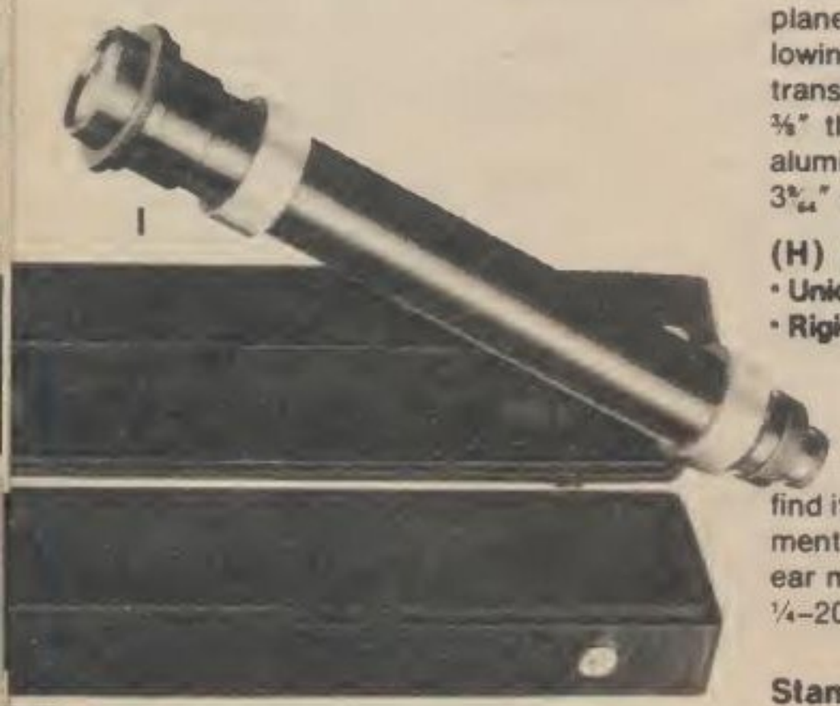


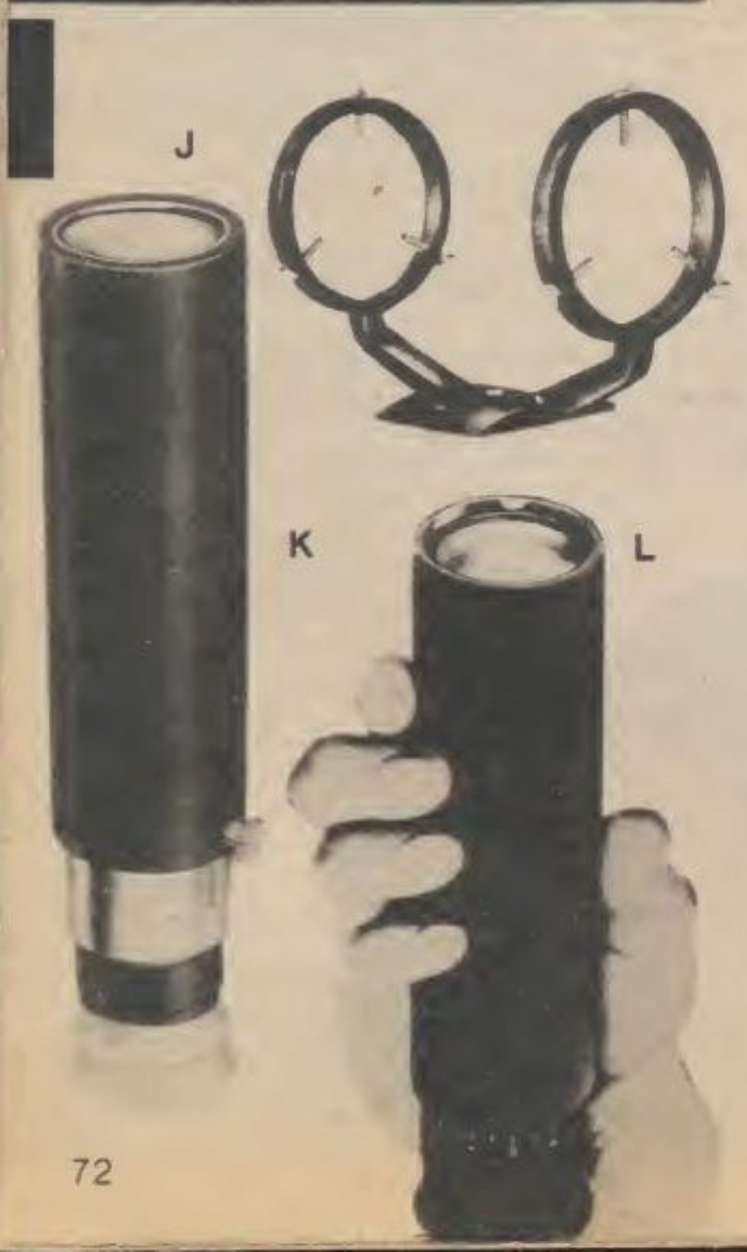


Optical Testing









Optical Benches And Accessories

Optical Benches

For mounting accessories, optical systems, etc.

1 meter bench	**No. 83,008**	**$ 59.50**
2 meter bench	**No. 83,018**	**119.50**

Pin Carriers fit above optical bench & hold access pins.

(A) 30 mm Carrier	**No. 60,823**	**$15.95**
(B) 60 mm Carrier	**No. 60,796**	**16.95**
(C) 90 mm Carrier	**No. 60,824**	**16.95**

(D) Mounting Pin . . . Fits on pin carrier and holds accessories. **No. 41,229 $11.95**

(E) Universal Connecting Base. Make linear or angular arrangements for 2 or more optical benches. Useful in setup for holography, etc. Metal; 6 x 10 x ¼". Adjustment screws & T-nuts included. **No. 71,551 $24.95**

(F) Component Holder Only $24.95. Self-centering variation of type we use in our own lab. Accommodates circular items such as lenses up to 55 mm. Slotted jaws (3 mm wide x 4 mm deep) for holding filters, Ronchi rulings, items 50 x 50 mm (2"x2") or 35 mm slide mounts. Vertical or horizontal use with ¼–20 tapped holes for optical bench use. Pin mount not included. **No. 42,114 $24.95**

(G) Uni-Pivot Gimbal Mount keeps adjustment problems to a minimum! Range: ±15° about 2 perpendicular axes in vertical plane w/30 sec. angular resolution. Pivot ball has ½" hole, allowing light beams under ¼" dia. to pass through any secured transparent optics. Has #6-32 tapped holes. ⅜" center hole in ⅜" thick mounting plate can be reworked to 1". Anodized aluminum, 5"x2"–⅜"x3". Center of gimbal aperture approx. $3\frac{3}{64}$" above bottom of plate. 1 lb. 7 oz. **No. 60,816 $59.95**

(H) Deluxe Rack and Pinion Unit

• Unique Coarse And Fine Adjustment
• Rigid Steel, Brass, Aluminum Construction

Here's ultra-precision in a linear stage for positioning cameras, parallax correction, optical bench testing; spherical aberration lateral color test; longitudinal color correction; coma test. Telescope makers will find it useful in Foucault, Dakin, Ronchi & caustic test. Adjustments; coarse ⅝" and fine $\frac{1}{16}$" advance per revolution. 9" linear movement on a 12x3x2" track. 2¼" x 3" platform has a ¼–20 tapped holes. Has oversized locking thumb screw.
No. 71,958 $99.95

Standard Rack And Pinion Units

• Perfect For Optical Research And Testing
• Provides Precise Linear Positioning

This unit's 2"x4" sliding platform holds virtually any equipment requiring precise linear movement. Platform has through-hole for camera or instrument mounting. Thumbscrew locks platform in position. Knob controls platform motion along 12" or 24" track (sold separately). Tracks have full length rack and mounting holes. Platform includes knob, pinion, thumbscrew, tension plate. Aluminum.

	No. 40,891	**$29.95**
12" Track	**No. 60,572**	**19.95**
24" Track	**No. 60,573**	**29.95**

(I) Surplus Collimator

Government surplus collimator. A $200 value. Excellent condition. Brass; 2" achromatic lens, 16" f.l.; crossline reticle; 17¾" length. **No. 70,050 $125.00**

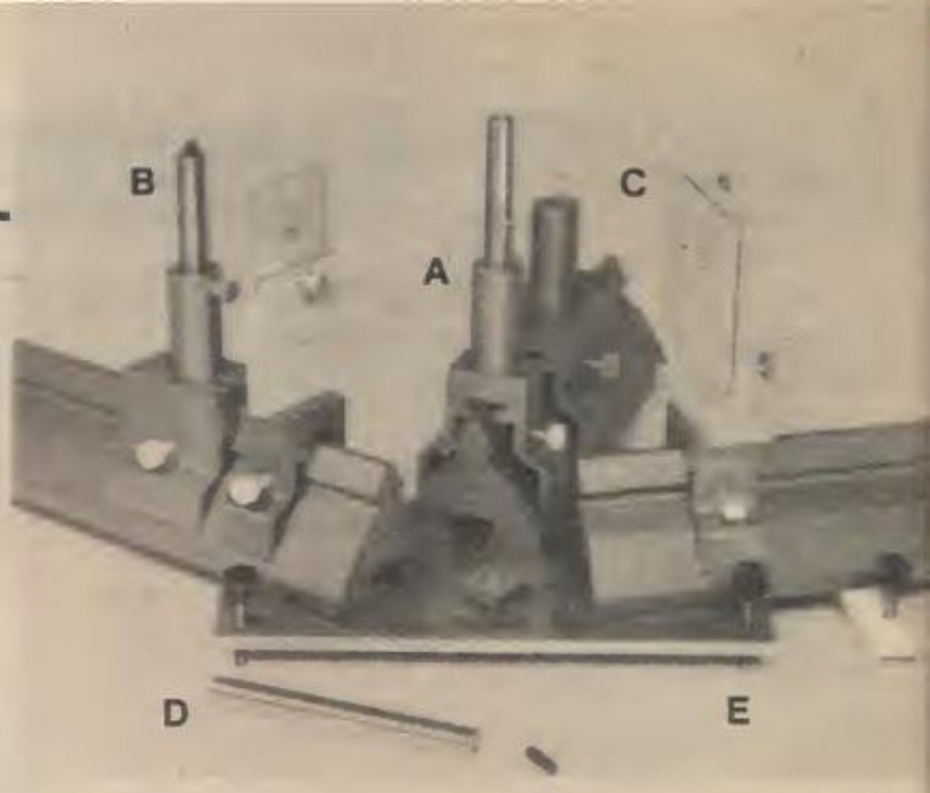
(J) Universal Ring Mount. 2⅞" dia. rings spaced 5¾" apart. Each contains 3 machine screws 120° apart. Useful with telescopes, lasers, etc. Tapped for ¼–20 post.
No. 71,791 $13.95

(K) Deluxe Optical Alignment Telescope

Focuses 20" to infinity. Versatile, accurate for aligning jigs, fixtures, radar antennae, towers and similar structures requiring precise positioning. High quality optics include slide-focusing, coated achromatic objective. Easily mounted on V blocks (not included) or on single base, 2-ring mount No. 71,791 above.

Specifications:

Objective:	51 mm achromatic, 180 mm f.l.
Power:	6X at infinity; 9.3X at 20".



Field:	10° at infinity.
Reticle:	Fine 90° crossline, glass reticle.
Size:	2¾" O.D. x 10¼" extends to 14⅝".
Eyepiece:	4-element, 30 mm f.l.; 60° apparent field.

No. 70,674 $129.50

(L) Auxiliary Telescope With High Quality Optics

• Draw Tube Model For Close Focusing.

This low priced, Auxiliary Close-Focusing Telescope (with reticle) focuses from 12" to infinity and can be used for alignment, measurement and observation. Gives sharp definition over entire field. Unmounted, w/aluminum body (1½" O.D.) for use in V blocks or w/standard lab clamps.

Specifications:

Objective:	32 mm, coated achromatic doublet
Power:	6.1X at infinity (inverted image)
Reticle:	Crossline type w/center markings; glass
Size:	1½" O.D. x 10½" long
Eyepiece:	Kellner, with diopter scale.

No. 60,941 $39.95

Low-Cost Optical Bench

• Measure Focal Length • Use As Collimator

This economy model was designed to fill the needs of schools, hobbyists, camera stores, small labs, and many other applications. It's actually a 1 meter (40") heavy-duty hardwood rule graduated in mm and inches with two adjustable metal ends (one reticle plate and one first surface mirror plate). It includes 4 V-shaped lens holders with spring clamps and thumb nuts. Use to check image quality, position lens elements, teach optics, etc. Includes instructions. **No. 83,003 $23.50**
Extra Lens Holder/Clamp **No. 60,069 3.75**

Books For Your Optical Library

"Collimators and Collimation".

Comprehensive, easily understood booklet written by optical technicians. Describes different kinds of collimators. 36pp. 50 drawings. **No. 9072 $2.50**

"How To Condense And Project Light"

The 32 page booklet, crammed with illustrations, covers spotlights and floods; homemade projectors and collimators: lamps, lenses, optics math and more. **No. 9044 $1.95**

"Optics and Optical Instruments"

By B. K. Johnson. Applications of optical principles . . . the eye, focal length measurements, scopes, optical glass, etc. Paperbound. 224 pages. **No. 9300 $4.00**

"Popular Optics" by Sam Brown

• Learn How to Make An Optical Bench
• Build Your Own Telescope

Here's the book that tells you everything you need to know about optics. You'll learn how to build demonstration instruments; how to make your own magnifiers; testing methods; and details on graphical ray tracing; fiber optics and more. Chapters include: Math vs. Graphical Trace, Magnifier Optics, and more. Illustrated, 192 page book. **No. 9445 $7.65**

"The Optical Bench" . . . Edmund and Brown

A guide to homemade optical benches . . . from the most simple construction to the most sophisticated. This handy reference for basic optics covers lens focal length relationship to optical benches. Sections include: Finding The Focal Length; The Lenses You Use; Demonstration Uses, and much more. 36 pages. Diagrams. **No. 9085 $0.90**

Optical Flats • Precision Flat Mirrors • Ronchi Rulings • Resolving Chart

Quartz Optical Flats

- Low Priced
- Top Quality
- In Stock
- American Made
- Certified Accuracies
- 1/10 Wave

Optical Flat Theory. Whenever light rays from one source are made to travel along two different optical paths and later allowed to recombine, the two rays will interfere with each other to produce observable and measurable interference effects. An optical flat is a precision flat reflecting surface against which the flatness of another surface may be compared.

What An Optical Flat Shows. When an optical flat is placed on a surface to be tested (under monochromatic light), dark and bright lines appear. These are called "interference bands" and are contour maps of the work surface. The amount the bands curve, with reference to distance between them, indicates the amount of flatness error. Straight, parallel, and evenly spaced bands mean the work surface is accurately flat.

Applications. Optical flats are versatile devices for measuring surface flatness of polished areas by determining variations between work surfaces and surface of the optical flat; inspecting gage blocks for wear and accuracy; and testing prisms, filters, optical windows, etc.

Free Optical Flat Booklet by Fred Abbott
This 16-page informative booklet details optical flat theory, use and applications. Included free with every optical flat purchase or yours free just by asking for this booklet.
No. 9880 FREE

Quality Optical Flats
Single surface flats of clear fused quartz with certified optical accuracies of 0.000002" (1/10 wave) or better. The second surface is felt polished for fine viewing of interference patterns. All edges are ground and chamfered. Flats made of quartz are superior due to their very low thermal expansion and have greater resistance to abrasion. Each is interferometrically controlled in production and furnished with a certification of its accuracy.

Dia.	Thickness ±.040"	Wave	Number	Price
1"	½"	1/10	1913	$ 33.95
2	½	1/10	1914	59.95
3	¾	1/10	1915	89.95
4	¾	1/10	1611	179.95
6	1	1/10	1612	379.95

Precision Flat Mirrors
• Aluminized Optical Flats
Made from high quality optical flats, these mirrors have the same guaranteed accuracies as our quartz optical flats . . . 0.000002" (1/10 wave) or better. These flats are aluminized and then overcoated. Exceptionally good for laser applications and holography, also in telescopes, siderostats, coelostats, and as reflectors for autocollimating photographic lenses and telescope lenses. Instructions included.

Number	Price	Dia.	Thick. ±0.040"	Wave
1919	$ 39.95	1"	½"	1/10
1920	64.95	2	½	1/10
1921	99.95	3	⅝	1/10
1615	209.95	4	¾	1/10
1616	419.95	6	1	1/10

Elliptical Mirrors
Telescope quality 1/8 wave flat mirrors

Number	Price	Minor Axis	Thickness
30,836	$ 7.95	⅞"	¼"
30,260	6.95	1 1/16"	¼"
30,205	7.95	1¼"	⅜"
30,258	13.95	1½"	⅜"
30,840	24.95	1⅞"	⅜"
41,131	39.95	2¼"	⅜"
42,583	43.95	2⅝"	⅜"
42,584	56.95	3"	⅜"

Contact our National Sales Department for quantity pricing on mirrors listed above.

The tested surface is accurately flat as shown by the parallelism and even spacing of the bands.

The tested surface has a slight spherocity as shown by the curved bands.

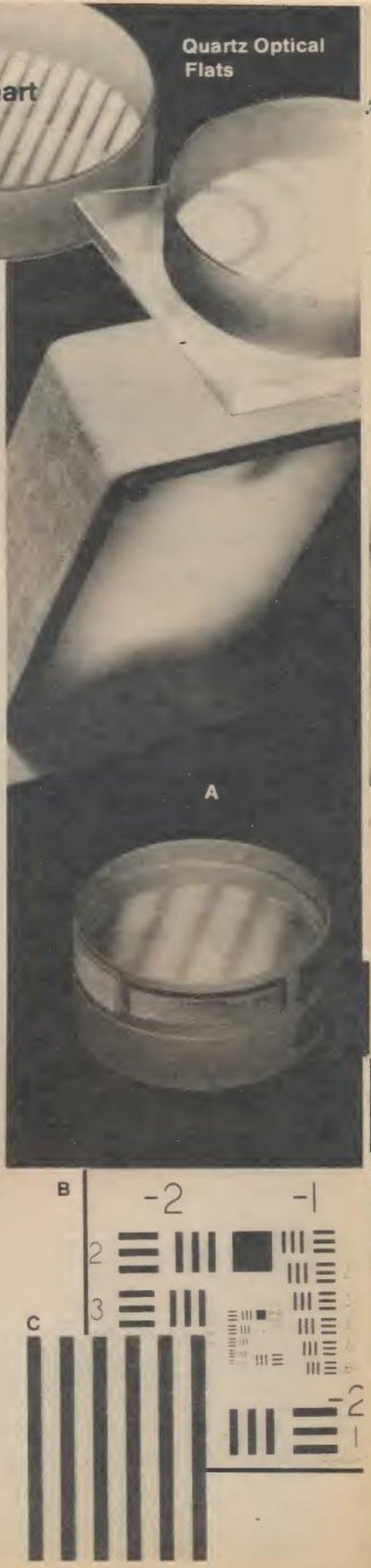
(A) Low-Cost Monochromatic Lamp
Portable 20 lumen light source. Very effective for viewing Brewster's Fringes, Newton's rings, testing optical flats, etc. Green filtered gas discharge lamp displays sharply defined interference fringes. 1200 starts per bulb; 120° angle of diffusion, 4 watts, 5460A wavelength, uniform illumination over 3 x 5" window; 115V AC. **No. 71,780 $59.95**
Replacement Bulb **No. 41,920 14.95**

(B) The Edmund Scientific Resolving Power Chart
Test the total performance capabilities of your optical system with the Edmund Scientific Resolving Power Chart. This testing pattern contains reproductions of the U.S. Air Force 1951 Test Pattern that is now the standard throughout the optical industry. The several sizes, positions, orientations, and colors of the 25 individual charts will make it possible to accurately assess your system's performance capabilities as well as to determine the effects of chromatic aberrations throughout the field of view. The USAF chart consists of a stepped series of three bar patterns (elements) arranged together (groups) in an orderly sequence. These test patterns are printed in black, red, yellow, and blue to test for chromatic aberration and at 90° for testing astigmatism. A description of the chart with standard resolution values and resolution formulation instructions for cameras and telescopic systems are included. 36" x 24" in size. **No. 83,001 $9.95**

(C) Ronchi Rulings Etched On Glass
Ronchi rulings are glass plates with evenly spaced lines running parallel to each other, filled with baked-in black opaque. Each line width and space width between lines is equal. When 2 rulings are placed in contact at right angles, spaces between lines become perfect squares. Typical optical uses include: making light gates; testing lenses for field flatness & as a wavelength scale in spectroscopy. Also used for measuring and calibrating microscopes in labs. All rulings parallel to the edge of the plate.

Lines/In.	Number	Price	Lines/In.	Number	Price
1 x 1" Size			2 x 2" Size		
50	30,511	$2.05	50	40,650	$ 8.00
80	30,512	2.05	80	40,652	8.00
100	30,513	2.05	100	40,654	8.00
133	30,514	2.95	133	40,656	11.50
150	30,515	2.95	150	40,658	11.50
200	30,516	2.95	200	40,660	11.50
250	30,517	4.25	250	40,662	16.00
300	30,518	4.25	300	40,664	16.00
4 x 4" Size			6 x 6" Size		
50	40,651	$27.25	50	40,668	$61.25
80	40,653	27.25	80	40,669	61.25
100	40,655	27.25	100	40,670	61.25
133	40,657	38.95	133	40,671	86.25
150	40,659	38.95	150	40,672	86.25
200	40,661	38.95	200	40,673	86.25
250	40,663	54.50			
300	40,665	54.50			

Originals! 500 Line Ronchi Rulings
Original masters, metallic filled on 1 x 2" glass, ¼" thick! 50-50 ratio of black to clear, parallel to 1" edge, one line every 0.002", accurate to 0.0002". Slightly out of specs (less than 0.0001"), ordinarily worth much more. **No. 40,737 $45.00**



Optics

Simple Lenses
Large selection of simple lenses for the optical experimenter or manufacturer. They are sold from stock to speed your order. All are sold as "seconds" because of slight imperfections. However, these minor flaws are not expected to interfere with their performance.

Better Grade Lenses
Some experimenters have asked for our lenses which have only minor imperfections for more exacting projects. We've selected the very best of each type & have placed an asterisk (*) after the Stock Number to designate "Better Grade" lenses.

Substitutions
Occasionally, when the exact lens you order is out of stock, we will substitute another lens that most nearly fits your requirements unless you specify on your order "No Substitutes". You may specify alternative choices.

Tolerances
Because of occasional substitutions, our dia. and F.L. tolerances are ±10% of those listed. We cannot fill orders specifying precise tolerances.

Ordering Lenses
Remember to include: (1) Stock Number (2) Price (3) Diameter (4) Focal Length

Plano-Convex Lenses (PCX)
Plano-Convex (PCX) lenses have one flat & one outward curving face. PCX lenses have a positive F.L. & act as magnifying glass.

Number	Price	Dia.	F.L.	Number	Price	Dia.	F.L.
94,725*	$1.50	5	8	95,161*	$1.50	8	60
94,806	1.40	7	16	94,764	4.80	51	64
94,007*	2.25	10	17	94,842*†	2.75	38	65
94,749*	1.80	10†	18	95,064	1.80	19	67
94,833*†	1.50	8	19	95,085	1.50	5	68
95,766*	1.60	4	21	95,066	1.80	12	69
94,829*	1.20	7	22	95,788	1.80	17	71
95,010	2.60	12	22	94,783*	2.40	39	74
95,015	2.70	14	23	94,069	2.10	43	76
94,693*	1.50	14	26	94,828*	2.20	45	78
95,767	2.10	10	28	94,164*	1.40	17	79
95,793	2.10	10	34	95,072	1.50	8	81
95,034	2.20	13	38	94,851	3.00	51	81
95,029	2.20	14	40	94,852	3.50	63	89
95,040	2.60	16	40	95,105	2.30	27	172
94,784*	2.10	39	82	94,841*†	7.50	95	183
95,077	1.50	77	92	94,807	2.10	42	201
95,168*	1.50	6	92	95,176*	1.50	6	201
95,081	1.80	19	94	95,116	1.50	8	203
95,085	1.80	14	97	94,748	1.25	33	223
94,808	2.10	45	112	95,122	1.50	9	265
95,738*	2.40	15†	112	94,739	1.80	42	267
95,787	1.80	22	117	94,127	6.95	89	305
95,095	1.50	8	125	94,745	1.60	38	308
95,770	2.00	25	132	94,744	1.60	38	333
95,697*	2.70	25	132	94,742	1.60	38	364
95,171*	1.50	6	134	94,131	3.95	44	401
95,098	1.60	10	150	94,133	6.00	89	483
95,099	1.60	12	150	94,135	10.95	86	571
94,102	4.95	31	152	94,747	1.60	40	667
94,853	4.50	21	40	94,743	1.60	38	800
95,056	1.80	11	50	94,746	1.60	38	1000
94,152*	1.30	16	55	95,142	1.60	12	1270
94,737*	4.00	48	57	94,830	1.50	40	2000
95,058	2.00	6	58	94,831	1.50	40	3810
94,832*	2.50	32	58				

Cylinder Lenses (CYL)
Curved in only one direction. They magnify or reduce in only one dimension.

Number	Type	Price	Size mm.	F.L. mm.
12,050	DCX	$1.30	3x9	1.4
30,620	DCX	1.30	4.5x10	2.1
94,723	PCX	1.30	4.8x5.3	11
40,212	PCX	5.95	24x169	44
30,240	PCX	6.95	57x200	86
50,157	PCX	9.95	57x400	86

Double-Convex Lenses (DCX)
2 outward curving faces, sometimes symmetric & sometimes with one curve sharper than the other. DCX lenses have a positive F.L. & act as magnifying or condensing lenses.

Number	Price	Dia.	F.L.	Number	Price	Dia.	F.L.
94,823*†	$7.95	9	7	94,266	$1.50	27	46
94,796*	2.10	7	8	95,268	2.00	21	47
95,184	2.40	6	9	95,270	1.50	14	48
94,798*	1.90	8	10	95,783	2.40	22	48
94,797*†	2.10	7	12	94,274	1.60	26	50
94,188	1.60	10	13	94,257	2.00	36	50
95,335*	2.70	8	15	95,277	1.80	17	50
94,754*	1.80	11†	15	95,368*	2.40	12†	50
95,203	1.80	5	18	95,286	2.20	24	50
95,201	2.00	8	18	95,714*	2.50	22	51
95,202	2.20	10	18	95,281	1.90	19	53
94,848*†	1.40	10	18	94,762	4.00	42	53
95,338*	2.50	8	18	95,283	2.30	32	54
94,750*	1.60	10†	19	94,282	1.80	35	55
95,761	2.10	7	21	95,772	2.30	30	55
94,824*†	6.95	16	21	94,369*	2.30	33pi	55
95,215	2.20	12	21	94,370*	2.00	33†	55
95,727*	2.50	8	23	95,292	1.90	18	58
95,218	2.00	6	23	95,296	1.90	25	58
95,711*	2.30	6	23	94,289	1.50	32	59
94,787	2.00	19	23	94,372*	1.40	23	59
94,854	1.25	14	25	95,728	2.20	22	60
94,799*†	1.90	19	27	94,373*	1.80	41	66
95,227	2.00	15	29	95,795	2.40	25	62
95,781	2.00	9	30	95,773	2.20	30	63
94,794	2.70	36	30	95,298	2.50	40	64
94,230	2.70	35	31	95,780*	2.40	27	64
94,753*	1.40	11†	31	95,301	2.20	33	65
94,349*	1.50	19	33	94,375*	1.40	33	65
94,236	1.20	14	34	95,771	1.90	25	68
95,245	2.90	23	35	94,378*	1.40	26	68
30,771	1.80	27	35	94,802	1.40	38	70
94,822*†	2.95	25	36	94,306	3.90	60	72
95,240	2.00	19	37	94,377*	1.50	37	73
94,800	1.80	32	38	94,827	1.20	24	77
94,817*†	5.25	29	38	95,310	2.10	32	77
95,354*	2.30	12	38	94,803	1.40	41	78
95,243	1.90	13	39	95,671	1.40	7	80
95,358*	2.10	10	39	95,796	2.10	35	82
95,359*	2.50	16	39	94,380*	1.50	32	82
95,246	1.80	10	39	94,801*†	2.10	37	85
95,247	2.30	18	39	94,805	1.60	45	85
95,249	2.40	23	40	94,779*	1.90	40	88
94,826*	1.70	34	40	94,318	2.10	54	89
94,256	1.40	29	43	94,757*	2.25	52‡	89
94,363	4.60	46	44	94,735*	2.90	51	100
94,825*†	3.00	40	44	94,804	1.60	42	120
95,782	1.80	11	44	95,784	2.20	24	128
95,362*	2.70	18	44	94,849	7.50	82	226
95,261	2.30	19	45	94,850*†	7.50	85	320
95,262	2.40	25	45	94,781*	1.50	40	2000
95,265	1.80	16	46				

Double-Concave Lenses (DCV).
Have 2 inward curving faces, sometimes symmetric & sometimes with one curve sharper than the other. DCV lenses have a negative F.L. & act as reducing or dispersing lenses.

Number	Price	Dia.	F.L.	Number	Price	Dia.	F.L.
94,844*†	$1.50	10	−11	95,448	$2.10	19	−43
94,838*†	1.50	8	−12	95,500*	2.00	11	−43
95,442	2.40	12	−13	95,472	2.10	25	−48
94,845*†	1.80	17	−18	94,501*	1.50	25	−48
95,447	1.80	13	−21	95,474	1.50	13	−50
95,453	2.30	23	−27	95,476	1.90	19	−50
95,458*	2.40	19	−29	95,503*	2.30	18	−52
95,798	2.30	26	−31	95,479	1.80	17	−55
95,797*	2.30	13	−32	95,800	2.40	33	−67
95,497*	2.40	17	−34	95,483	1.50	12	−68
95,461	2.00	20	−35	95,485	1.90	19	−70
95,799	2.10	26	−37	94,507	1.30	19	−79
94,498*	1.40	22	−37	94,846*	6.50	77	−87
94,463	1.50	33	−38	94,847*	6.50	72	−95
94,496*	2.00	33	−38	94,839†	2.00	29	−144
95,466	1.90	20	−43				

Meniscus Lenses (MNS)
One outward curving face and one inward curving face. If the outward curve is sharper than the inward one, the lens is positive and magnifies. If the inward curve is sharper, it reduces.

Negative Meniscus Lenses

Number	Price	Dia.	F.L.	Number	Price	Dia.	F.L.
95,563	$2.00	5	−8	94,613*	$1.40	24	−74
95,564	1.80	9	−17	95,583	1.80	18	−89
95,605*	2.20	11	−20	95,586	2.50	40	−95
94,607*	1.40	13	−31	95,591	2.40	37	−125
95,609*	2.20	16	−33	94,598	1.50	55	−169
95,570	2.10	24	−39	94,624*	2.20	52	−238
95,576	1.90	21	−66	94,813	1.40	38	−257
95,612*	2.00	15	−72	94,601	1.40	51	−264
95,580	2.40	35	−73	94,602	2.95	58	−800

Positive Meniscus Lenses

Number	Price	Dia.	F.L.	Number	Price	Dia.	F.L.
95,702*	$2.20	7†	17	94,664*	$2.95	58	222
95,803	2.20	13	18	94,642*	2.15	30	250
95,703*	2.40	15†	23	94,648*	2.95	41	250
95,760*	2.20	11	29	94,733*	4.25	51	250
95,801	1.50	10	50	94,668*	2.95	58	285
95,802	1.50	10	67	94,840*†	4.50	74	287
95,521	1.80	18	85	94,662*	2.95	58	308
95,557*	1.90	18	91	94,641*	2.15	30	333
95,523	2.00	21	101	94,647*	2.95	41	333
95,526	1.80	15	101	94,732*	4.25	51	333
94,528	1.40	35	105	94,663*	2.95	58	400
95,535	2.70	33	120	94,548	1.50	38	403
95,722	1.80	19	122	94,646*	2.95	41	500
94,538	2.30	59	132	94,731*	4.25	51	500
94,561*	1.40	25	136	94,661	4.95	88	667
94,643*	2.15	30	166	94,812	4.00	82	727
94,734*	5.25	51	166	94,639	2.15	30	1000
94,649*	5.95	41	166	94,645	2.95	41	1000
95,543	1.80	18	212	94,730	4.25	51	1000

Low-Cost Rectangular And Square Lenses

Number	Price	Qty.	Size mm.	F.L. mm.	Type
P-99,001	$ .85	2	13x13	3	PCX
P-99,003	.70	2	8x8	36	PCX
P-99,004	.75	2	11x14	43	PCX
P-99,005	.70	2	11x12	51	PCX
P-99,006	.70	2	10x10	55	PCX
P-13,201	.70	2	10x10	64	PCX
P-99,009	.75	2	12x16	73	PCX
P-99,010	.85	2	14x19	78	PCX
12,057	2.30	1	64x64	235	PCX
P-99,017	.80	2	8x8	18	DCX
P-99,018	.85	2	15x15	23	DCX
P-13,202	1.60	2	36x36	54	DCX
P-12,051	2.00	1	51x51	64	DCX
12,029	1.60	1	51x51	127	DCX
12,033	1.40	1	38x89	182	DCX
P-99,024	.75	2	9x16	−15	PCV
P-13,203	.75	2	10x11	−24	PCV
P-99,029	.75	2	8x11	−37	PCV
P-13,204	.85	2	21x25	−50	PCV
P-99,034	.65	2	8x10	−51	PCV
P-99,041	.65	2	12x17	−89	PCV

Note: All 95,000 series are Packages of 2 lenses (*) Better Grade (†) Coated (•) Mounted (‡) Beveled Edge. All diameters & focal lengths are measured in millimeters.

P-99,042	.65	2	14x22	−100	PCV
P-99,043	.65	2	17x22	−136	PCV
P-99,051	.60	2	11x15	−39	DCV
P-99,054	.75	2	12x12	−52	DCV
P-99,055	.70	2	11x15	−64	DCV
P-99,057	.65	2	12x16	−85	Neg. Men

Attn: Manufacturers. Large Quantities Available!

Plano-Concave Lenses (PCV)

PCV lenses have one flat & one inward curving face. PCV lenses have a negative F.L. & act as reducing or dispersing lenses.

Number	Price	Dia.	F.L.	Number	Price	Dia.	F.L.
94,835	$1.10	15	−13	94,763	$3.50	51	−56
95,389	1.50	5	−20	95,805	1.50	5	−61
95,391	1.80	13	−23	95,408	2.70	33	−62
94,843*†	1.80	17	−23	94,437*	1.50	33	−73
94,718	1.30	18	−20	95,411	1.80	16	−74
95,454	1.80	16	−28	94,815	2.10	42	−84
95,396	2.00	18	−30	95,416	2.20	22	−85
94,429*	1.40	18	−33	95,420	1.80	17	−100
94,719	3.50	32	−34	95,439*	2.40	17	−100
95,430*	2.10	16	−34	95,418	1.50	13	−116
95,400	1.90	17	−36	94,836*	2.00	45	−130
94,788*	2.00	38	−38	95,425	1.50	12	−148
94,834	2.00	40	−40	94,837*†	10.95	20	−193
95,402	1.50	14	−46	94,814	1.80	42	−244
94,816*	1.80	35	−53				

Achromatic Lenses (Color Corrected)

Simple lenses focus various colors at different points. Achromats correct this by using one flint glass & one crown glass, usually cemented together. They also correct certain other aberrations. Most high quality instruments have achromats due to their superior performance. Most are perfect, some slight seconds, all edged, centered, cemented, & guaranteed usable. When ordering list Stock Number & Price. If you include diameters and focal length please use millimeters figures. (1"=25.4 mm).

Note: Since many of our lenses are surplus, our stocks constantly change. We suggest specifying an alternate. If ordered lens is unavailable, we will send the closest substitute unless you state otherwise. Dimensions listed in whole numbers even though actual sizes are fractional (e.g., 5.3 mm dia., 27.6 mm f.l. lens is listed as 5 mm dia., 28 mm f.l. lens). All tolerances are ±10% (e.g., 5 mm dia., 25 mm f.l. listed lens may be 4.5–5.5 mm dia., 22.5–27.5 mm f.l.). Airspaced lenses indicated by "†".

Number	Price	Dia. mm	f.l. mm	Comments
30,672	$10.75	4	9	Triplet
6390	7.95	7	12	
30,673	10.75	6	14	Triplet
6391	6.95	4	16	
30,674	10.75	7	17	Triplet
6387	8.25	12	17	
6388	7.95	8	18	
6389	7.00	10	22	
30,751	4.50	5	24	
30,750	4.60	5	24	Mtd.
6386	7.50	10	25	
30,120	14.95	15	25	Triplet
6382	4.60	9	28	
30,496	5.25	11	29	Ctd.
5148	5.25	18	29	
5131	7.00	18	19	Ctd.
30,472	5.00	18	32	
5206	9.95	16	35	Ctd.
30,764	5.25	12	35	
5120	5.50	18	36	
5186	6.50	18	36	Ctd.
6381	4.50	13	37	A
6380	5.00	13	37	A, Ctd.
30,565	5.25	13	38	Ctd.
6191	8.95	18	38	
6228	5.00	15	41	Ctd.
6393	8.95	10	42	Ctd.
94,820	15.95	9	43	Ctd.
30,229	12.25	23	43	Triplet
30,749	4.60	20	44	
40,807	5.50	20	44	Mtd.
30,765	5.50	13	45	Ctd.
6335	11.25	28	47	
6218	5.75	13	49	Ctd.
6394	8.95	10	50	Ctd.
40,172	3.75	18	50	Mtd.†
40,577	5.00	19	51	
30,562	5.50	10	55	Ctd.
42,300	6.95	13	55	Ctd.
94,818	7.95	22	55	Ctd.
6292	5.25	22	55	Mtd.
30,571	5.75	16	57	Ctd.
30,777	8.75	37	58	Type A
42,789	6.50	28	60	Ctd.
6246	37.00	39	63	Ctd.
30,778	12.50	40	64	Type A
6317	11.00	30	66	A, Ctd.
30,570	5.25	21	67	Ctd.
30,490	5.25	23	68	Ctd.
41,888	15.75	26	69	Triplet
42,792	24.50	46	78	Ctd.
6017	3.50	12	80	
6210	4.00	12	80	Ctd.
94,821	14.95	16	81	Ctd.
40,616	5.75	36	85	Ctd.
6408	6.00	36	87	Ctd.
6308	5.00	33	90	A
6407	5.50	33	90	A, Ctd.
6279	3.50	16	92	C
6187	4.25	25	95	
6227	5.25	25	95	Ctd.
6302	3.50	15	98	C
41,889	32.75	36	98	Triplet
30,766	4.60	13	100	Ctd.
30,484	6.00	33	100	Mtd., Ctd.
30,483	5.50	33	100	Ctd.
40,614	6.00	36	100	Ctd.
6357	5.00	34	103	†
30,569	5.50	30	109	Ctd.
40,619	6.50	35	119	Ctd.
94,819	11.95	25	120	Ctd.
6162	5.00	25	122	A
6233	5.75	25	122	Ctd.
6409	4.50	16	124	Ctd.
6410	5.00	16	124	Mtd., Ctd.
30,482	5.25	26	126	Ctd.
40,615	6.00	40	126	Ctd.
40,899	7.25	40	126	Mtd., Ctd.
6176	5.25	38	130	
6285	5.75	38	130	Mtd.
6212	6.50	31	132	
5175	5.75	32	132	
5182	6.50	32	132	Ctd.
5222	15.00	37	150	Ctd.
30,603	9.95	29	162.5	
41,049	7.25	45	172	Ctd.
6353	7.25	35	176	Mtd., Ctd.
42,790	6.50	45	177	Ctd.
6415	5.25	32x34	190	
6183	7.75	45	191	Ctd.
40,970	7.50	45	191	Mtd., Ctd.
5216	9.75	52	193	Ctd.
41,266	22.50	52	220	
6329	3.50	25	279	C
30,534	8.75	36	336	
60,428	18.75	48	360	Mtd.
30,201	6.25	32	788	Ctd.
30,190	89.00	76	1143	Ctd.†
50,107	175.00	102	1524	Ctd.†
70,163	350.00	127	1803	Ctd.†

Negative Achromats

42,791	5.50	17	−34	Ctd.
30,448	8.95	18	−47	
42,782	19.95	26.4	−109	Ctd.
30,255	6.75	42	−139	Ctd.

Magnifier Lenses

These unmounted, commercial magnifier lenses are seconds due to slight chips or scratches. All are DCX. When mounted, most mars won't hurt performance.

Number	Price	Size mm	F.L. mm
12,051	$2.00	51x51	64
12,029	1.60	51x51	127
12,033	1.40	38x89	182
42,649	2.50	50x99	222
12,057	2.30	64x64	235
12,078	3.50	57	66
12,092	2.10	46	95
12,010	2.30	64	154
41,919 (plastic)	5.50	190	790

Demonstration Lens Set

Set of 6: plano-convex, plano-concave, convex-concave, double convex, double concave, concave-convex. 50 mm dia. min. **No. 40414 $13.95**

Edmund's Famous Lens Kits

For Hobby, Experiment, Classroom Use

The glass lenses in these kits are worth many times the price. Since the edges are slightly chipped, we offer them at these low prices.

10 Lens Kit. You can easily make a 4.4X Galilean Telescope, 12.4X Astro Telescope, 3X Double Lens Magnifiers, 5X and 14X Pocket Magnifiers; 40X Microscope; 35 mm Slide Viewer and other useful instruments. 16 page instruction booklet. **Kit No. 2 $4.95**

35 Lens Kit. Larger, more versatile kit: 35 lenses, all marked with individual specifications. Greater variety allows more advanced experimentation. Make all instruments in Kit No. 2 plus many more of your choice. 16 page instruction booklet. **Kit No. 5 $12.95**

60 Lens Kit. Extra large assortment of 60 lenses identified by type, f.l., and dia. Recommended for classroom, optical lab, & advanced amateurs. Includes 32 page "Fun With Optics" booklet. **Kit No. 10 $19.95**

Air-Spaced Achromatic Objective Lenses

Quantity prices available. Contact National Sales Dept.

Lenses are precision ground, color corrected, free of coma & spherical aberrations, air-spaced, low-reflection coated on all 4 surfaces & mounted. Packed in sturdy black metal cases w/threaded retaining rings.

Number	Price	Dia.	F.L.	Mounted	O.D.	I.D.
50,162	$ 99.50	3"	45"	yes	3⅛"	3"
70,128	195.00	4"	60"	yes	4⅛"	4"
70,164	375.00	5"	71"	yes	"	5"
30,190	89.00	3"	45"	no	—	—
50,107	175.00	4"	60"	no	—	—
70,163	350.00	5"	71"	no	—	—

*Mounted in cell with 5½" O.D., 6½" flange with adapter for mounting in 6⅞" tubing.

Lens Cement Bonds At Room Temperature.

Outstanding polyester resin bonds lens elements in 3 hours without heat! Superior to Canada Balsam. Refractive index n_D is 1.55 at 25° C. Withstands temperatures of −65° to +212°F. One bottle cement and one bottle catalyst.

3cc Set. **No. 40,774 $ 2.50**

2 oz. Set **No. 60,506 10.50**

Helpful Books In Optics

"Fun With Optics" Building optical instruments inexpensively; telescopes; microscopes; magnifiers; binoculars; etc. 32 pp. Illustrated. **No. 9050 $1.50**

"Optics And Optical Instruments" by B. K. Johnson. Applications of optical principles . . . the eye, f.l., measurements, optical glass, etc. 224 pages. Paperbound. **No. 9300 $4.00**

ESC 60 mm f/8 Achromatic Lens. Very high quality. 60 mm f.l.; 2.500" dia.; 2.362" clear aperture; 1.51673 n_D.; 64.2 dispersion.

60 mm f.l., f/8 unmounted (wt. 0.495 lb.) **No. 42,817 $54.95**

60 mm f.l., f/8 mounted (wt. 0.936 lb.) **No. 42,818 $69.95**

Optics

Condenser Lenses

Condensing lenses concentrate light into a projected beam. Used in projectors, enlargers, spotlights, and photo cell systems, they are usually mounted in pairs so that their convex surfaces are nearly in contact. The equivalent f.l. of the lenses combined equals one-half the f.l. of a single element. Condenser-equipped enlargers (usually plano-convex) produce snappier prints. Projectors, especially slide projectors, usually have two asymmetrical convex lenses, and sometimes only one condenser element.

Matte condenser lenses have a finely ground plano surface and are used in condenser systems to create soft images or portraits.

Because slides are normally mounted and positioned a short distance from the condenser, you will require lenses somewhat larger in diameter than the diagonal measurement of the slide. Refer to the chart for the approximate lens size to meet your requirements.

Picture or Slide Size	Dia. in mm	F.L. in mm of Condenser to Use
8mm	19 to 44	13 to 76
16mm	25 to 44	25 to 76
35mm	51 to 76	76 to 102
1¼x1⅝"	60 to 89	76 to 127
1⅝x2½"	89 to 127	114 to 178
2¼x2¼"	102 to 127	127 to 178
2¼x3¼"	114 to 127	140 to 178
2½x4½"	152 to 178	229 to 254
4x5"	165 to 203	254 to 305

Condenser Lenses

Number	Price	Dia. mm	F. L. mm	Type
30,525	$ 2.95	23	33	PCX
30,543	2.50	49	57	PCX
30,732	2.90	94	114	PCX
61,144	8.50	80	127	PCX
1144	11.50	113	141	PCX
61,145	7.50	89	203	PCX
72,333†	14.50	127	203	PCX
42,448	11.50	113	212	PCX
70,302*	39.50	165	229	PCX
72,334†	20.00	165	254	PCX
72,335†	22.50	178	254	PCX
72,336	45.50	178	254	PCX
1189	39.95	152	356	PCX
72,337	89.00	229	356	PCX
72,338	114.50	305	381	PCX
72,055	80.50	227	526	PCX
30,499**	2.00	33	32	DCX
30,727**	3.70	45	54	DCX
94,318**	2.10	54	89	DCX
61,106**	11.50	114	286	DCX
61,253	5.00	64	160	DCX
61,254	6.50	76	191	DCX
94,306**	3.90	72	60	DCX

*Indicates better grade lens
†Indicates matte finish on plano side
**Indicates assymetrical

Heat Absorbing Condenser Lenses Made of Pyrex® Brand Sheet Glass

Number	Price	Comments	Dia. mm	F. L. mm
30,753	$2.80	PCX	27	31
30,799	2.60	DCX	31	45
30,733	4.40	Asym. DCX	46	47
1184*	4.60	Meniscus	42	60
40,908	3.95	PCX	43	62
30,800	2.90	DCX	38	64
42,348	4.00	PCX	50	77
42,570	3.50	Meniscus	60	124

*Special tempered glass for high heat uses

Aspheric Condenser Lenses

These have a short f.l. in relation to their diameter. Use when a compact, intense light system is needed.

Number	Price	Dia. mm	F.L. mm	Comments
42,788	$4.00	50	35	PCX
42,787	3.25	38	40	MNS
40,339	4.60	73	46	DCX
60,359	4.60	67	46	PCX
60,356	4.60	71	62	PCX

Heat Absorbing Glass

Use between bulb and condenser lens to protect optics and slides from excessive heat. Manufacturing defects result in a number of harmless bubbles. Non-tempered glass listed should not be used without blower with bulbs over 150 watts.

Number	Price	Size mm	Thick. mm
30,789	$1.20	21 dia.	2.0
30,790	1.50	30 dia.	2.3
30,791	2.25	38 dia.	3.0
30,792	3.00	51 dia.	6.4
42,784	1.75	55 dia.	4.0
4010	1.25	51 x 51	6.4
4063	1.75	59 dia.	4.0
42,783	3.95	76 dia.	6.4
4009	3.95	102 x 127	6.4

Optical Diffusing Glass

Similar to ground glass, but one surface is flashed with a milky white "opal" covering to diffuse light evenly. 4"x5"x⅛" thick. **No. 2149 $2.15**

Rectangular Ground Glass

Glass finely ground on one side to give good light diffusion. Excellent for camera viewing screens, rear projection screens & enlargers.

Number	Price	Size	Thick.
30,759	$0.90	2 x 2"	1/16"
30,493	1.00	1 1/32 x 1 11/16"	3/63"
30,456	.95	1⅜ x 2"	1/16"
30,665	.95	2 3/16" sq.	1/16"
2143	1.25	2¼ x 3¼"	1/16"
42,785	1.40	3½ x 4⅜"	1/16"
2144	1.40	3¼ x 4¼"	1/16"
2148	1.90	4 x 5"	1/16"
2146	1.95	5 x 7"	1/16"
60,120	2.95	7 x 7"	1/16"
2147	3.95	8 x 10"	1/16"

Large Surplus Buy!

220 mm F.L. Achromatic Lens

High quality, 52 mm dia. 220 mm f.l. achromat. Ideal for finder scopes, optical systems.

No. 41,266 $22.50

50 to 199 **Only $19.50 ea.**

200 or more—Contact our National Sales Dept. for special pricing.

Low Cost Quality Fresnel Lenses

Fresnel lenses are practical and a lot of fun . . . whether used to build a money-saving overhead projector, as a large area magnifier, or an unusual trick photo gimmick. But what is a Fresnel lens? It is a flat, thin piece of plastic in which are molded a series of small concentric stepped zones. They extend from center to outer margins. Each groove is a minute refracting facet capable of bending light. Its transmittance (ability to pass light) is greatly increased over that of a conventional lens of the same focal length. Thus a larger diameter, lightweight and inexpensive lens with a short focal length is possible. They have countless uses; see our wide selection below.

Number	Price	Size	Thick.	F.L.	Lines/In.
30,389***	$3.95	2⅛x2¼"	1/16"	3"	215
41,351	6.75	4x5"	1/16"	8½"	50
41,352	7.00	5x7"	1/16"	8½"	50
40,803	7.25	5½x6"	1/16"	8½"	50
40,954	10.25	6" sq.	3/32"	10"	110
42,808	4.95	6" dia.	1/64"	13½"	50
42,807	7.95	6½" sq.	1/16"	13½"	50
72,247***	6.00	6¼x9⅛"	3/32"	12½"	120
61,191	2.75	6 9/10x9¼"	1/16"	12½"	
60,498†	7.00	8x10"	1/16"	12¼"	50
60,826	7.00	8x10"	1/16"	8½"	50
61,126	4.00	9" dia.	1/32"	7"	50
70,670††	6.00	10½" sq.	1/16"	12¼"	50
71,315	6.00	10½" sq.	1/16"	8½"	50
72,250†	5.00	10¾" dia.	1/16"	3½"	50
72,245	6.00	11" sq.	1/16"	7"	50
72,246	6.00	11" sq.	1/16"	9¼"	50
70,878†	6.00	11" sq.	1/16"	18"	50
71,316†††	12.00	11⅛" sq.	5/32"	5½"	50
70,877	7.25	11¼" sq.	3/32"	16"	55
60,500	13.50	11½x16⅛"	3/32"	19¾"	65
70,533††	6.95	11¾" sq.	1/16"	8½"	50
72,332	7.50	15" dia.	3/32"	8"	50
72,062	6.00	15½" dia.	3/64"	11½"	50
70,716	32.95	16½x21⅛"	⅛"	24"	50
70,717	45.95	19x24¾"	⅛"	24"	50

†Large quantities available
††Includes "Fun With Fresnel Lens"
†††Cemented double lenses
***Frosted

Fantastic Fresnel Lens Sheet Lets You See 9 Repeats At Once

9-in-1 Fresnel lenses. Each one of these 2x2" lenses is a miniature Fresnel lens with a wide 180° angle. They can be cut up and framed individually or used as a single sheet for decorative use.

No. 61,250 $3.95

"Fun With Fresnel Lens"

Plans and instructions for building an image brightener, solar furnace, camp cooker, overhead projector and camera obscura. Each requires only one Fresnel lens. These projectors are great for scouts, hobby clubs and "shop". Build an overhead projector worth $175 for a total cost of about $45!! Illustrated, 16pp. Paperbound.

No. 9053 $1.00

Surplus

Image intensifier. Frosted Fresnel lens. 176 x 235 mm. **No. 61,191 $2.75**

Negative Fresnel Zone Diffuser. 23¼" free aperture in mount with overall diameter of 28¼".

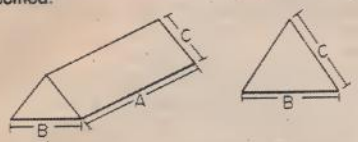
No. 85,316 $80.00

What Are Prisms?

A prism is a transparent body, usually glass, that reflects, refracts or disperses light. Used in optical instruments to erect, revert or rotate images, they are often hard to obtain. We have a large variety of surplus prisms that we sell below manufacturer's cost!

How We Specify Prism Sizes

The illustration below will help you visualize the way we specify the sizes of prisms in our listings. "B" is the width of the base; "A" is the length of the base; and "C" is the height of the prism's face. All dimensions in the listings are in millimeters (mm) unless otherwise specified.

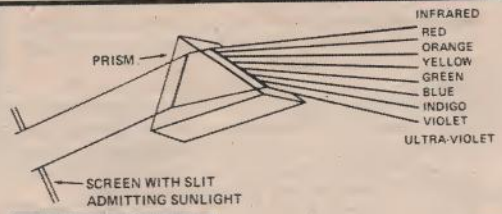


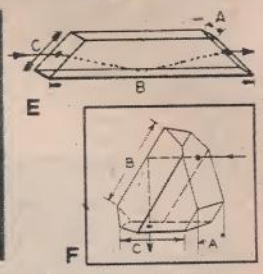
(A) Right Angle Prisms

***Large Quantities Available**

For use when light path changes of 90° are needed. Top & bottom images are the same; right & left sides are reversed. Ideal for use in binoculars, telescopes & other optical instruments. Some listed are slight seconds. **An (*) asterisk after the stock number indicates large, continuing supply.**

Number	Price	B	C	A	Comments
30,575	$4.95	8	7	7	
30,576	5.95	18	13	13	
3301*	7.95	21	15	15	
3309	8.50	21	15	15	Silvered
30,577*	8.95	25	19	19	
3072	2.60	30	19	13	Miniature Porro Prism
40,995*	12.95	36	25	25	
30,632*	13.95	40	29	29	
3057	3.00	42	27	20	Porro Prism
40,865	5.50	43	29	20	Round Corners
3312	3.00	43	27	20	Silvered; Round Corners
5211	5.75	43	26	21	Ctd.
41,002*	17.95	43	31	31	
5114	7.95	51	35	25	Ctd.
40,866	4.00	53	35	25	Round Corners
41,003*	27.95	53	38	38	
801	7.95	54	38	146	Better Grade; Plain
800	7.25	54	38	146	Better Grade; Silvered
808	2.60	54	38	28	
3274	2.60	54	38	28	Silvered
809	3.75	54	38	38	
3275	3.75	54	38	38	Silvered
3169	6.95	57	40	41	Light flint Glass
3299	6.95	67	48	48	Cut corner on face
41,711	5.75	63	42	31	
810	6.95	69	49	54	
807	11.25	69	49	167	Ctd. mtd. Silvered
42,305	9.75	70	47	34	Porro Prism
806	10.25	69	49	167	Second Grade; Silvered
41,004*	52.50	71	51	51	
60,649*	89.95	89	63	63	
60,233	27.50	90	63	93	¼ wave, Silvered
60,650*	125.00	108	76	76	
71,858	88.50	124	89	89	Silvered
42,778	7.95	33	34	47	Cut Corners





(B) Giant Right-Angle Prisms

Finely ground & polished 90°–45°–45°; were used in tank periscopes. Normally retail for $15 to $60. Excellent for optical experiments, camera clubs & demonstrations; they may have minor flaws. All are size: **B=54, A=146, C=38 mm.**

No. 800	**$7.25**	Better Grade Silvered Prism
No. 801	**7.95**	Better Grade Plain Prism
No. 802	**4.95**	Second Grade Silvered Prism
No. 803	**5.75**	Second Grade Plain Prism

For even larger tank prisms, see Nos. 806 & 807 at left.

(C) 60 Degree Equilateral Prisms

Quality prisms for school use.

Number	Price	Face Size	Length
30,762	$5.00	1"	1"
30,294	10.95	1"	2"
30,295	19.95	1"	3"
30,296	29.95	1"	4"
30,297	49.95	1"	6"

(D) Corner Cube Reflector Trihedral Prisms

Each with knife-edge roof. Material Bk-7; Flatness to 1/10 wave. Imported 1" corner cube. Ray deviation: 16–25 arc secs. **No. 41,378 $44.95**

2½" Corner Cube. Ray Deviation: 1–5 arc secs. **No. 41,399 $149.50**

(E) Dove Prism

As you look through this plastic prism while rotating it, the image you see rotates through an angle twice as great as the prism angle. **A: 29 B: 72 C: 13 mm**
No. 42,667 $1.25

(F) Corrected Amici Roof Prisms

Amici prisms erect image & bend line of sight through a 90° angle. High quality precision grade, with accuracy of several secs. of arc. Excellent as prism diagonal in astronomical refractor telescopes.

Number	Price	B	C	A
3,106	$7.95	16	15	14
3,038	8.95	34	20	18
3,002	9.95	41	21	22

(G) Prism Assembly

Limited Supply . . . Special Purchase

2 coated porro prisms, precison aligned in black metal housing. Aperture: 10 mm dia., 25 mm optical axes spacing. **No. 30,848 $9.95**

(H) Erecting Prism

Mounted, 2 element, 5 reflection prism assembly is a useful component for image inversion. Height: 19.5 mm; Dia: 24.9 mm. Mounting dia. 23.0 mm; aperture stop: 7.9 mm; cell is black anodized aluminum.
No. 30,847 $29.50

Experimenter's Choice!

Cube. Polished on 4 sides. 6.7x6.7 mm. **No. 3305 $2.25**

Octagon. 7.9x5.5 mm, dia. 13.5 mm for 8 mm movie editors. **No. 3288 $ 2.25**

Penta Roof. 39x45x36. **No. 42,776 37.50**

Pechan Type 25x42x25 **No. 42,781 9.95**

Isosceles. 33x25x43 **No. 42,777 12.95**

Porro System. Entrance faces measure 21x21 mm. **No. 30,279 $6.50**

Pentagon. 75% roof, 24x28x9 mm **No. 3,210 2.95**

Porro-Abbe. 9x12 mm **No. 3,006 1.50**

Rangefinder Ocular Assembly **No. 3,070 7.50**

Porro. Tapered B-60, C-39, A-22 **No. 3,219 3.75**

Penta. 4x8x8mm, silvered. 5 sides reflect light rays @ 90° angle. Erect image. **No. 30,355 $9.95**

Penta. 10x27x27, base & 2 sides painted. **No. 42,779 $19.95**

Penta. 10x27x27, unpainted. **No. 42,780 19.95**

Wedge Prism. 22x22x18 mm. About 40°, silvered. **No. 42,251 $5.75**

Reflecting Prism. 37 x 103 mm., silvered. Originally used on runways to reflect landing lights. **No. 42,574 $4.60**

120° Constant Deviation Prism. Originally used in bombsights. A=45, B=18, C=18 mm. **No. 30,801 $3.50**

Unmounted Wedge Window. 60 sec. deviation. 92 mm dia. x 8.5 mm thk. Borosolicate crown glass n=1.517; v=64.5. **No. 30,155 $7.00**

90° precision ground & polished glass prism. 11/16" base. Incl. instructions. **No. 8,100 $1.50**

60-Degree Spectroscope Prism

Polished surfaces flat to ½ wave. Angles accurate to 5 minutes of arc. Polished surfaces dimensions 1 x 1 3/16". Made from dense flint glass free of refraction striae and strain. Index of refraction 1.648. Use with all spectroscopes. 60° angle gives greatest dispersion for spectrum consistent with least loss of light. Use to make a spectroscope. **No. 30,143 $13.95**

Binocular Replacement Prisms (Porro)

Number	Price	Binocular	Prism Sizes in mm	Coated
5,114	$7.95	7x50	B=51.5, C=35, A=25	Yes
41,711	5.75	7x50	B=63, C=42, A=31	No
5,211	5.75	6x30	B=43, C=26, A=21	Yes

Optics

Front Surface Mirrors, Plane

A front surface mirror is aluminized on the surface nearest the object to be viewed. Light reflects from this near surface with no refraction. A second surface (conventional type) mirror reflects light from its back (far) surface and refraction occurs giving "ghost images" (see sketch). Sizes given in mm.

Number	Price	Size	Thickness	Comments
40,238	$0.95	9 x 19	1.75	
40,284	1.20	13 x 25	6.0	
30,546	.95	14.5 x 19	1.75	
30,875	2.95	16 x 23	6	Flat to ¼ Wave
30,625	1.50	18 dia.	0.15	Ultra Thin
40,286	1.60	21 x 26	6	
30,621	2.25	21 dia.	1.2	
30,428	1.50	22 x 35	6.3	
30,286	6.95	25 x 35	6.0	Flat to ¼ Wave
30,626	1.65	25 dia.	0.15	Ultra Thin
30,429	1.80	32 x 40	3.2	
30,622	1.20	30 dia.	1.2	
26	1.80	34 dia.	3	
30,623	1.40	40 dia.	1.0	
30,465	3.00	40.5 dia.	5.0	
591	2.00	43 x 46	3	
547	2.60	43 x 140	3	
42,214	1.75	48.5 x 70	3	
41,619	1.50	49 x 49	0.75	Very thin
40,040	2.95	51 x 76	6.0	
42,384	3.00	52 dia.	5	
40,773	1.80	57 x 70	3	
589	2.60	59 dia.	1.8	
41,742	3.00	60 x 131	4	Bev. edges; cutcorn.
41,166	1.95	60 dia.	1.0	
40,324	2.30	63 x 76	3	
42,385	3.00	64 dia.	3	
42,213	2.30	64.7 x 70	3	
41,620	2.25	67 x 67	1	Very thin
30,209	5.75	67 x 83	5	Beam spltr.
42,212	3.00	70 x 97	3	
42,211	3.00	70 x 194	3	
40,041	1.95	76 x 102	6	(3 x 4")
41,621	2.95	81 x 100	1	Very thin
40,042	5.95	102 x 127	6	(4 x 5") Bev.
41,320	8.95	127 x 178	1.6	(5 x 7") Edges
40,043	8.50	127 x 178	6	(5 x 7")
41,321	15.95	204 x 254	1.6	(8 x 10")
40,067	13.95	204 x 254	6	(8 x 10")
85,036	21.45	254 x 356	6	(10 x 14")
85,206	29.25	406 x 406	6	(16 x 16")
85,207	59.95	508 x 609	6	(20 x 24")

Front Surface Mirrors, Concave

Number	Price	Size, mm	F.L. mm	Comments
566	$1.20	35	–15	Metal
41,051	3.00	33	–21	Glass
42,842	2.25	51	–23	Metal
41,052	3.00	32	–25	Glass
42,669	3.00	35	–16.5	Glass
42,477*	5.25	55	–35	Glass
41,053	3.00	35	–38	Glass
41,054	3.75	52	–38	Glass
42,668	6.50	82	–2,000	Glass

*5.5mm centerhole

Second Surface Mirrors, Glass Concave

Number	Price	Dia.	Approx. F.L.	Wt.
60,616	$4.95	6"	16"	4 oz.
60,617	8.95	8"	16"	10 oz.
80,097	20.95	16"	22"	6 lbs.

High Quality Gold Mirrors

For the separation of infrared & visible light. Useful as filters in projection systems & as collectors in I.R. systems. Flat mirrors are efficient reflectors. Additionally, concave mirrors will focus infrared energy. Reflectivity: 35% at 4000–4500 Å; 46% at 5000 Å; 81% at 5500 Å; 92% at 6000 Å; 98% at 7800 Å to beyond 15 microns wavelength. Inconel layer under gold increases opacity to I.R. & decreases heating of substrate. Protective stripping lacquer coated.

Flat Mirrors (inconel and gold on plate glass):

3 x 4 x ¼" thick	No. 41,801	$4.95
4 x 5 x ¼" thick	No. 41,800	6.95
5 x 7 x ¼" thick	No. 41,802	9.95
8 x 10 x ¼" thick	No. 71,709	15.95

Concave Mirrors (inconel and gold on flint glass):

32 dia. x 5 x 25mm F.L.	No. 41,806	$4.95
52 dia. x 8 x 38mm F.L.	No. 41,807	6.95
75 dia. x 8 x 760mm F.L.	No. 41,808	23.95

Astronomical Mirrors . . . Edmund Manufactured

4¼" dia. & larger; made from Pyrex® glass. Polished to ⅛ wave, aluminized & overcoated. Contact our National Sales Dept. for other sizes & quantity pricing.

Spherical

Number	Price	Dia.	App. F.L.	Thickness
40,913	$ 9.95	2½"	25"	⅜"
50,082	13.95	3"	30"	⅜"
50,051	29.95	4¼"	45"	⅝"
71,026	58.95	6"	60"	1"

Paraboloidal

Number	Price	Dia.	App. F.L.	Thick-ness	Ship wt.
42,451	$ 46.95	4¼"	17"	¾"	
72,472	81.95	6"	30"	1"	3 lb.
72,361	81.95	6"	36"	1"	
85,298	159.95 T.C.C.	8"	40"	1⅜"	5.5 lb.
5002	74.95	6"	48"	1"	
85,069	138.95 T.C.C.	8"	64"	1⅜"	5.5 lb.
85,334	234.00 T.C.C.	10"	60"	1¾"	11 lb.
85,070	249.00 T.C.C.	10"	80"	1¾"	11 lb.
85,335	349.50 T.C.C.	12½"	75"	2⅛"	21 lb.
85,071	369.00 T.C.C.	12½"	100"	2⅛"	21 lb.

Surplus Front Surface Mirrors.

48.5 x 70 x 3 mm. Pkg. of 40. **No. P-61,099 $11.50**

Surplus Parabolic Mirror.

25" dia., 8¾" f.l. Glass. 14 lb. (6.4 kg.)
No. 85,317 $250.00 T.C.C.

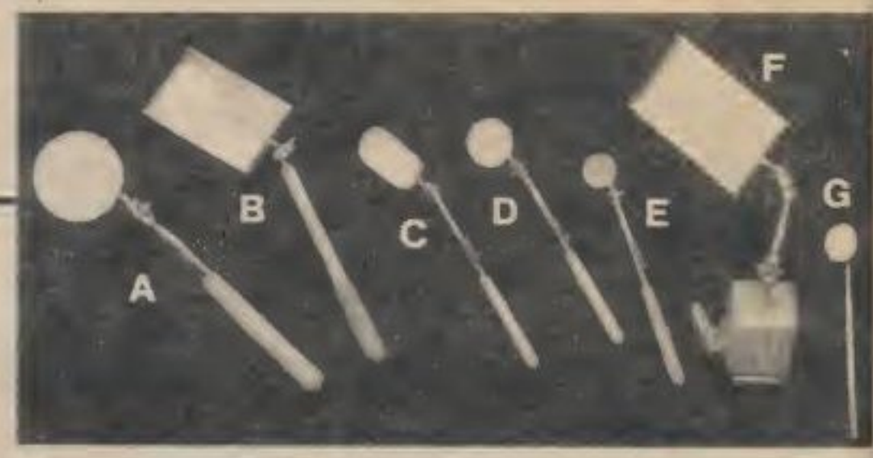
Optically Flat Glass.

These surplus circular & rectangular pieces of optically flat glass are ground & polished with both sides parallel.

Number	Price	Dia. mm	Thick mm	Number	Price	Dia. mm	Thick mm
30,648	$.90	4.5	1	2199	$ .90	27	1
2074	.90	5.1	1	2206	.90	27	2
2075	.90	6.3	1.5	2089	.90	27.4	3
2187	.90	8.2	2	2186	.90	29	3
40,216	.90	9	5	30,729	1.40	27.5	1
40,221	.90	10	2	2091	1.40	30	2
2105	.90	12.5	2	30,468	1.20	33	2.4
30,581	.90	13	5	30,582	1.20	34	3
2080	.90	16	3	30,772	1.40	35	10
2082	.90	17	2	2093	1.20	35.9	3
2098	.90	18x18	2	30,454	1.20	37	3
30,469	.90	18.5x12	2	2184	1.20	38	1.5
30,650	.90	19	5	2065	1.40	41	8
2083	.90	19.5	2.9	2207	1.40	41.4	2.3
2203	.90	21	1	2209	1.40	53x113	7
2084	.90	21	2	2069	1.40	54x75	3
2099	.90	21x46	3	40,262	1.40	57x74	4
2086	.90	22.9	8	2070	1.40	63	3
30,773	.90	25	3	42,786	1.20	78x192	3.2

One Way Transparent Mirrors

Useful in industrial & optical applications where 50% reflection is required. Can also be used for "one-way" viewing. Reflection or transmission determined by intensity of light on viewer's side relative to light on other side. Available in conventional glass sheets (commercial quality) or on transparent sheets of film. The sheets are ideal for many fascinating applications where flexibility or curvature is needed.



Transparent Glass Mirrors

No. 30,630	$1.25	2"x2" (Pkg. of 2)
No. 40,044	1.00	2"x3"
No. 40,045	1.90	3"x4"
No. 40,046	2.75	4"x5"
No. 40,047	3.95	5"x7"

Transparent Mirror Film (0.007" thick Mylar™)

No. 83,002	$11.50	42"x48" sheet
No. 70,326	7.95	21"x36" sheet
No. 60,113	2.95	10½"x18" sheet

Optically Flat, ¼ Wavelength Plate Glass Window
"Second" **No. 42,638 $7.50**

Flexible-Backed Glass Mirrors . . . Create startling new designs on flat, concave or convex surfaces! Used by architects & interior designers for unique accents in homes & offices. Just peel back sheets for single use or cut.

Number	Price	Mirrors	Size
71,260	$19.95	3200	¼x¼" on 12x24" sheet
60,815	3.95	576	¼x¼" on 6x6" sheet
60,239	3.95	144	½x½" on 6x6" sheet
71,261	12.95	50	2x2" on 12x24" sheet
60,241	2.95	36	1x1 on 6x6" sheet
60,246	1.25	1	10x10 cm (4x4")
60,247	1.95	1	10x15 cm (4x6")

Amazing Mirrors With No Glass. A fraction of the cost & weight of comparable high quality, 1st surface plate glass mirrors! Polyester film vacuum-coated w/aluminum, stretched over lightweight backing. Mounts anywhere. No ghosts or distortion. Will not fog even after hot showers. Shatterproof. Ideal for hospitals & children's rooms. Wt. 6 oz./sq. ft.

12 x 16 x 9/16" (9 oz.)	No. 71,339	$29.00
24 x 24 x 1 3/16" (1½ lb.)	No. 80,146	67.00
25 x 30¼ x 9/16"	No. 80,260	56.00

Specialty Mirrors

Ball-Joint . . . All-Angle Viewing Mirrors. Double ball joints swivel these copper-backed mirrors a full 360° for accurate inspection of hidden areas. Tempered steel spring joints move freely, take endless repositioning. Chrome-plated handles, vinyl grips.

Item	Number	Price	Mirror Size	Arm Size
*(A)	60,014	$6.95	2¼"	7–13"
*(B)	60,010	6.95	3½ x 2⅛"	11¼-15¼"
(C)	60,012	4.95	1 x 2"	6"
(D)	60,013	4.95	1¼"	8"
(E)	60,011	3.95	¾"	7"

*Telescoping handle non-swivel.

(F) 2⅛ x 3½" Mirror on Alnico Magnetic Base. Has two ball joints. **No. 60,015 $19.95**

(G) 15/16" Dental Inspection Mirrors. Will withstand extreme temperatures. Arm size 6½". (Non-swivel)

Standard	No. 60,004	$2.75
Magnifying	No. 60,005	2.75

Reflect Light Without The Heat of I.R. . . . Use A "Cold Mirror"

Now you can build projection systems with less heat build-up. This 4"x5" glass mirror will reflect 90% of visible light & allow 80% transmission of I.R. waves. ⅛" thick; cut to desired size. Great for microscopy, specimen illumination, lighting systems & many other applications where high temperature bulbs are required for lighting purposes. **No. 42,414 $15.95**

Big Concave Mirror. Second surface glass mirror to make a solar furnace or reflector. 16" dia., ⅛" thick, 22" f.l. Aluminized back. 6 lb. **No. 80,097 $20.95**

Filters

Optical, Multi-Layer Dielectric Interference Filters

These are high quality passband interference filters offered in the most popular wavelengths. All are blocked from 100.0 nm (1,000 Å) through 10,000 nm (100,000 Å). May be used with Osram or mercury vapor lamps, to single out a particular spectral line. Transmission outside the passband is less than 0.01% for all wavelengths. Each filter available in ½x1" or ¾x¾" or 25 mm dia. size. Center wavelength tolerance—±2.0 nm; Bandwidth tolerance—±1.5 nm; Blocking range—far UV to far I.R.; Degree of blocking—10^{-4}—4.0 absorption units.; Thickness—less than 6.4 mm.

NM Wavelength	$11.95 ea. ½ x 1	$12.95 ea. ¾ x ¾	$39.50 ea. 25 mm Dia.	NM H.B.W.	Min. % Trans.	Comments
405.0	30,688	30,704	30,913	9.2	40	Mercury Line & Analysis
420.0	30,689	30,705	30,914	7.4	45	Mercury Line
435.8	30,835	30,846	30,915	7.0	45	Chemical Analysis
450.0	30,690	30,706	30,916	6.5	45	Chemical Analysis
460.0	30,833	30,844	30,917	6.8	45	Chemical Analysis
480.0	30,832	30,843	30,918	7.1	45	Chemical Analysis
505.0	30,754	30,755	30,919	7.4	50	Chemical Analysis
520.0	30,738	30,744	30,920	8.2	50	Chemical Analysis
540.0	30,880	30,884	30,921	8.7	50	Chemical Analysis
546.1	30,695	30,711	30,922	8.8	50	Mercury Line
550.0	30,834	30,845	30,923	9.2	50	Chemical Analysis
577.0	30,697	30,713	30,924	9.8	50	Mercury Line
589.6	30,698	30,714	30,925	10.0	50	Sodium Line
600.0	30,699	30,715	30,926	10.1	50	Chemical Analysis
620.0	30,700	30,716	30,927	10.6	50	Chemical Analysis
650.0	30,702	30,718	30,928	11.4	50	Chemical Analysis
656.3	30,881	30,885	30,929	11.5	50	H Line
671.0	30,882	30,886	30,930	10.8	45	Li Emission
765.0	30,883	30,887	30,931	10.7	45	K Line Emission
905.0	30,740	30,746	30,932	12.8	45	Gallium-Arsenide Emission

Neutral Density Filters

Spectrally flat from 400 nm–900 nm. Variation from spectral flatness will not exceed ±15%. Neutral density tolerance—±15%; Thickness—ND 0.15–2.0; less than 0.25 in. (6.4 mm).

Optical Density at 500 nm	Nominal % Trans.	$11.95 ea. ½x1"	$12.95 ea. ¾x¾"	$39.50 ea. 25 mm Dia.
0.3	50	30,888	30,894	30,933
0.5	32	30,889	30,895	30,934
1.0	10	30,890	30,896	30,935
1.3	5.0	30,891	30,897	30,936
1.5	3.2	30,892	30,898	30,937
2.0	1.0	30,893	30,899	30,938

Beam Splitters

(A) Prism Type . . . A prism beam splitter is two right angle prisms cemented to form a cube. Sometimes one hypotenuse is partially aluminized. When you look into it, you see straight ahead as well as at a right angle. Transmission 30%. Reflectivity 30%. Approximately 40% of light absorbed by reflectance coating.

No. 42,819*	Size 11 mm	$11.50
No. 30,329	Size 15 mm	14.95
No. 40,887	Size 20 x 29 mm	15.95
No. 40,996	Size 25 mm	31.95
No. 41,211	Size 40 mm	28.50
No. 60,273	Size 49 x 53 mm	29.50
No. 30,769	Size 22 mm	20.00

*Coated

(B) Mirror Type . . . These beam splitters reflect 30% of light, transmit 30% (except No. 61,097 which transmits 70%). Very neutral color characteristics. Interference coating extra curable. Glass parallel to 20 seconds of arc. Surface flat to approximately 10 wavelengths.

No. 578	Size 67 x 83 x 5 mm	$7.00
No. 40,921	Size 57 x 74 x 4 mm	5.95
No. 30,725	Size 21.5 x 30 x 1.6 mm	2.25
No. 61,097	Size 5 x 7 x ⅛"	9.95

(C) Variable Density Beam Splitter. 3" inconel coated. Its density varies linearly w/length from 0.02 (96% transmission) to 2.0 (1% transmission). This is an excellent instrument for precise adjustments of spectrophotometers, monochromators & lasers. May be used two at a time to control transmission of an optical system differentially to produce a smooth variation in energy being transmitted. **No. 41,960 $26.50**

New! Beam Splitters of Different Sizes & Types

Non-Antireflective Coated:

No. 61,258	30R/70T 5"x7"	$10.95
No. 72,500	30R/70T 10"x14"	27.95

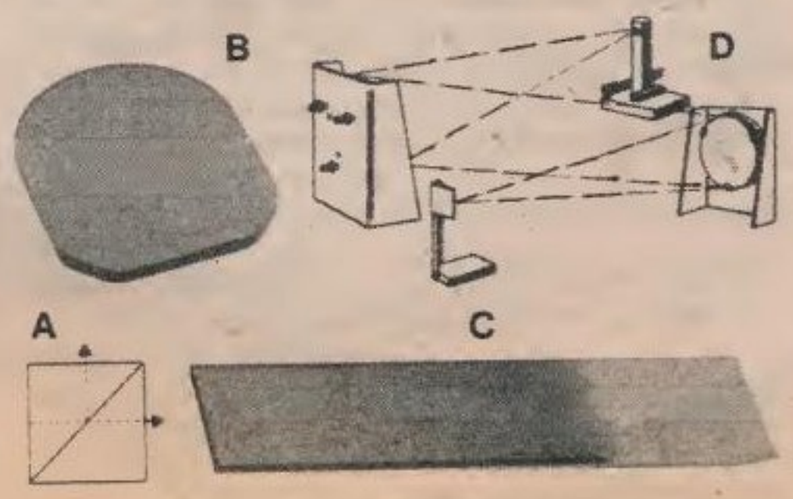
Antireflective Coated:

No. 61,259	40R/70T 5"x7"	13.95
No. 61,260	40R/60T 5"x7"	13.95
No. 72,501	30R/70T 10"x14"	42.95
No. 72,502	40R/60T 10"x14"	42.95

Note: R & T denote reflectance & transmittance.

(D) 4¼"x6" Schlierens. Shows clear, bright evidences of turbulence in liquids & air currents; tests internal character of glass; determines sound velocity & mass of microscope particles. Field will appear bright or gray with bright patches, depending on air flow. Each system contains 2 aluminized front-surface mirrors (4¼" or 6" dia.) f/10, overcoated with silicon dioxide & mounted in metal strands. Foucault tester, mirror covers & instructions included.

4¼", 45" f.l.	No. 71,014	$135.00
6", 60" f.l.	No. 71,013	199.50



Handy Tools For Engineers, Designers & Experimenters

(E) Dual Indicating Calipers. Ideal for machining & woodworking. Measures inside & outside dimensions up to 6" or 15 cm. Both metric & English inch scales have amplified graduations for easy reading. Adjustable thumb nut permits use as fixed gauge. Chromium plated steel stamp.

English Inch Scale	No. 61,168	$36.50
Metric Scale	No. 61,211	36.50

(F) Slip-Joint, Soft-Jawed Pliers For Optical Assembly 3 position pliers loosen or tighten rings on lenses from ½–2¼" dia. Nylon non-slip cushions in jaws protect fine knurling & delicate finishes. 9¼" long. Strong cadmium-plated steel. Sure-grip handles apply maximum uniform pressure. **No. 60,832 $19.95**

2 Replacement Cushions No. P-30,664 3.95

(G) Retaining Ring Pliers Kits. Replaceable tip pliers kit makes snap ring placement & removal simple. Set includes internal & external pliers w/rubber grip handles & 2 pairs each of color-coded tips: 90° angle (0.035" dia.), 45° angle (0.045" dia.) & straight (0.045" & 0.070" dia.). Also includes convenient plastic carrying case. **No. 42,625 $19.95**

For more quality calipers, see page 81.

Optics

A

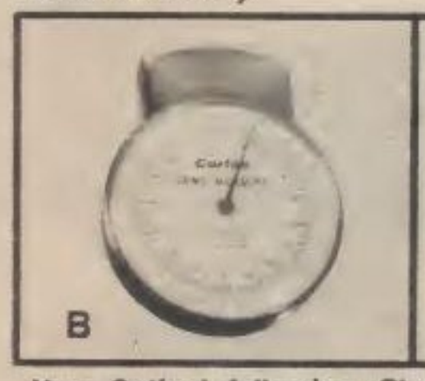
(A) Edmund Spanner Wrench. A vital tool for work with optical instruments, this wrench set is perfect for production lines, repair shops, camera & optical goods stores . . . anywhere the removal & replacement of threaded retaining rings is required. Adjustable for ½" to 7" rings. Hex-bodied tips slip into hex-hollowed arms & lock securely w/set screws so tips will not rotate. Aluminum bodies w/locking knobs hold aluminum arms in vise-like grip against bar. Includes 1 set of adjustable arms 3½" to 3" below wrench body; 2 high tensile steel bars 3½" & 7" long (⅜" across flats); 3 pairs of general purpose tips, two 0.025" thick (flat) & two 0.062" dia. (pin type) & instructions. **No. 70,751 $32.95**

Multi-Purpose Ultraviolet Lamps.
• Includes 2x4" Magnifier • Light At A Touch!
Excellent for flaw inspection; leak detection; medical diagnosis in labs, retouching and more. Pedestal stand unit has 2 high-output ultraviolet (2537A) tubes & two daylight tubes which can be used interchangeably or simultaneously. Centered 2x optical magnifier, dual switches & rugged housing. Swivel joint makes lamp adjustable on stand. Uses 115 V AC, 60 Hz. 253.7 nm.

Bench Lamp.	**No. 72,398**	**$135.00**
Hand-Held Unit	**No. 72,397**	**119.50**

(B) Diopter Gauge For Lens Curvatures.
With Non-scratch Plastic Tips. Precision instrument measures lens curvatures, selects blanks, etc. 0 to ±17 diopters in ¼-diopter increments. Directions to compute f.l. on all 6 types of spherical lenses.
No. 42,126 $79.95

(C) Static Neutralizer for dust-free negatives, cleaner lenses, spotless prints. Contains a self-energizing piezoelectric crystal—no radioactive materials, no batteries or parts to replace! A great tool for eliminating static electricity! **No. 61,247 $29.95**


B

C

New Optical Adhesive. Clear, colorless liquid photopolymer that will cure when it's exposed to ultraviolet light. Excellent for bonding optical elements where bonding surface can be activated by light.
No. 42,192 $7.25

Optical Black & White Paints
Velvet-finish enamels in 5-oz. spray cans for primed metal or wood. Black makes perfect light absorbing and diffusing surface for interiors of telescopes, cameras and other optical equipment, darkrooms, etc. White uniformly scatters incident light from any angle.

Black	**No. 60,608**	**$7.50**
White	**No. 60,609**	**7.50**

D

Pressure-Sensitive Flock Paper
Peel off backing and apply. Ideal for building or improving a telescope by lining tubes. Black, velvet-like, non-reflecting surface provides millions of light traps, far superior to flat, black paint. 20x30" sheets.

Single Sheets	**No. 70,621**	**$ 3.95**
Pkg. of 50 sheets	**No. P-70,622**	**117.95**
Non-adhesive 27x36" sheet	**No. 60,068**	**2.95**

Pressure-Sensitive Plastic Tape Rules
Hard-to-get. Handy to stick on shop equipment, optical benches, etc. Sturdy plastic, ½" wide; sharp black 10 cm, yard, metric markings on yellow or white background. A roll of 18 each is 0–10 cm in mm, 0–36" in ⅛", 0–100 cm in mm. **No. 42,171 $11.95**

(D) New Optics Cleaning Set. Includes one lens brush; 500 (7¾x3½") lens tissues and two 4 oz. bottles of lens cleaner. It won't evaporate. Used in military and space optics at NASA.

Lens Cleaning Set	**No. P-42,697**	**$5.95**
Package of 6 lens cleaners	**No. P-61,200**	**8.95**

Lens Cleaning Brush. 1¼" long, retractable soft bristle, gold-finished metal case, 2⅞" long by 1/16" diameter.
No. 40,504 $2.25

Lens Cleaning Tissue: Top quality, soft, made for optical instrument lenses & objectives. Pure, won't scratch, low cost, used at army optical manufacturing shops. Meets Military specs.

500 sheets (7¾x10¾")	**No. P-736**	**$8.95**
500 sheets (7¾x3½")	**No. P-60,375**	**3.95**

Five In One Precision Machine Shop—It's A Lathe, Drill, Mill, Grinder, Polisher

Whether you are a home or professional mechanic, a research worker or a technician, an industrial model maker or a hobbyist, the Unimat 3 offers you the versatility, performance and convenience of 5 basic shop machines in one compact, precision tool. With optional accessories you can turn, face, bore, grind, saw, mill, thread, drill, sand, buff—do many jobs on just one machine. You can change setups in seconds and cut virtually all metals, woods, and plastics.

The Basic Unimat 3 includes: T-ribbed lathe bed of high-grade cast iron for rigidity with ground V-guideway, headstock with motor, tailstock, longitudinal and cross slides, tool holder, face plate, lathe dog, 2 dead centers, 2 Allen keys, 1 double-ended spanner, tightening pin, and operating instructions. See specifications of basic machine below. Shpg. Wt. 16 lbs.
(E) Unimat 3 No. 85,315 $349.00 TCC

Unimat 3 Specifications

Dist. between centers:	200 mm
Center Height:	46 mm
Swing Capacity:	92 mm
Cross Slide Travel:	52 mm
Tailstock Barrel Dia.	18 mm
Barrel Traverse:	23 mm
Spindle Nose:	M14x1
Spindle Bore:	10.2 mm
8 Spindle Speeds	130/200/350/560/920/1500/2450/4000 rpm.
Motor Type:	Magnet, 115V AC 60hz, 1 ph
Drive:	Constant Torque V-Belt
Weight:	16 lbs.

Unimat 3 Accessories:

(F) Vertical Drilling & Milling Unit. For drilling & milling at any angle up to 90°. Specs: col. dia. 28 mm, max. dist. cross slide to vert. spindle 195 mm, throat 64 mm, drilling stroke 25 mm, spindle nose M14xl. Simply attach motor from headstock to unit. **No. 72,413 $84.95**

(G) Top Slide. Permits turning internal & external tapers up to 40 mm long. Graduated scale for taper angle. Built-in toolholder. **No. 61,185 $54.95**

(H) Live Center. **No. 42,660 24.95**

(I) 3-Point Steady Rest. Recommended for work on long & tubular pieces & facing long pieces.
No. 61,181 $22.95

(J) Indexing Attachment. Incl. division plate 24.
No. 61,180 $58.95

(K) Machine Vise. Max. capacity 29 mm. Mounts in T-slot of the cross slide. **No. 61,182 $43.95**

(L) Tool Grinding Attachment. Complete with grinding wheel & cover. Mounts on lathe bed. Good for turning tools and twists drills. **No. 61,178 $43.95**

(M) Milling Table. Incl. 2 clamping shoes.
No. 61,179 $39.95

(N) Power Feed Gear. Unit permits automatic longitudinal feed of workpieces. **No. 72,414 $54.95**

Division Plates Set. Incl. plates 30, 36, 40.
No. 61,197 $43.95

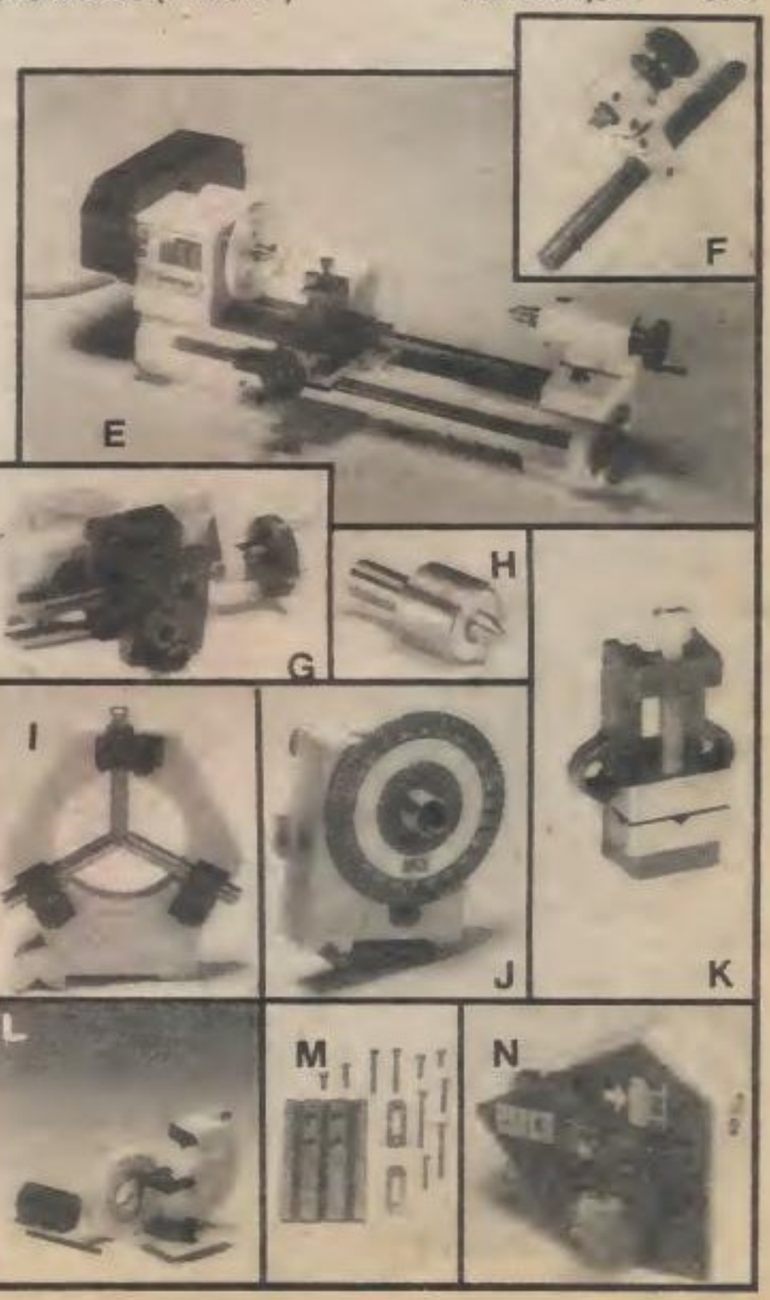
3 Jaw Chuck. A universal lathe chuck.
No. 61,183 $66.95

4 Jaw Chuck. Has independently adjustable jaws.
No. 61,184 $66.95

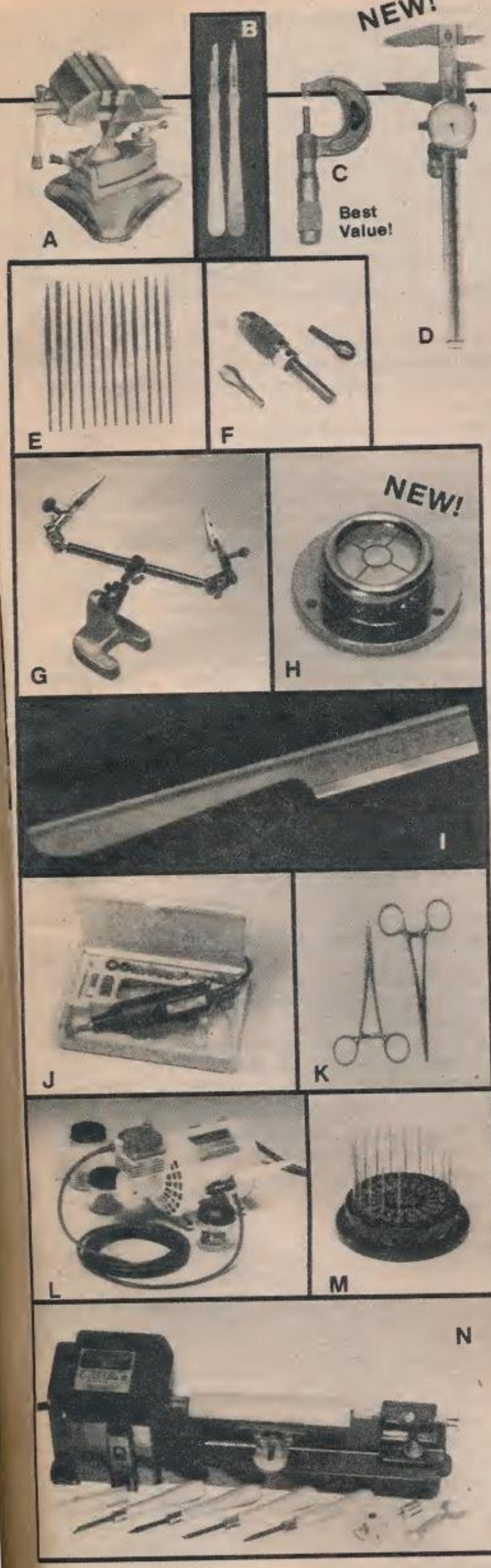
¼" Drill Chuck. 3 jaw. **No. 42,659 24.95**

Tool Bit Set. Includes 6 assorted, ground tool bits.
No. P-42,661 $39.95

Drilling & Milling Tool Set. Incl. one each; 2, 3, 4 & 5 mm twist drills; 1, 5 mm dia. center drill; 90 countersink bit; 4 mm dia. slot cutter; 16x4 mm dia. two-flute cutter.
No. P-61,198 $28.95



Tools



(A) Vacuum-Base Vise With Universal Swivel. Adj. head locks securely in any position; super holding vacuum base anchors to non-porous smooth surfaces. Portable. Universal ball joint. Working angles: 360° horizontal; 180° vertical. V-groove iron jaws open to 3" on steel guide rods. 3x⅝" jaw faces. **No. 71,144 $32.95**

(B) Disposable Scalpels. 8, stainless steel on metal handles. 4 each of 2 styles. **No. P-42,629 $3.25**

(C) Metric Micrometer With Carbide Faces. Measures from 0–25 mm; accurate to 0.01 mm. Barrel graduated every 0.01 mm; constant pressure thimble graduated in 0.01 mm. Satin chrome finished; lever-type lock. In wood box w/setting spanner. **No. 42,597 $37.95**

(D) Dial Vernier Calipers . . . Inches & Metric. Stainless steel, dial calipers feature 6" range with reading & accuracy of 0.001", PLUS a full 150 mm vernier caliper! Also: inside, outside & depth measurement, adj. dial, 0.001" dial & a 0.1 mm vernier plate, & metal case. Plastic seal in rear opens to reset to "0". **No. 42,765 $89.95**

(E) Needle Files . . . 12 shapes. Coarse to fine. Each 5½" overall. **No. P-30,113 $14.25**

(F) Pin Chuck For Holding Small Drills Firmly. 3 tapered collets (0–1/32", 1/32–1/16", 1/16–3/32"). Whole length of collet grips drill. **No. 41,643 $14.95**

(G) Flexible Holding Jig . . . Frees your hands. 3 double ball joints & 2 spring clamps . . . adjust to almost any position! Won't tip—heavy (9 oz.) base. Alligator clamps tightly hold objects up to 1 lb. **No. 42,089 $9.25**

Sensitive Circular Level. Level in all directions with 1 reading. When bubble is centered, base is level. Use on cameras, telescopes, or industrial instruments. Base dia. 1". Acute sensitivity of 45 min., ±10% each 0.1" bubble move.
No. 40,068 $4.95. 2 or more $4.25 ea.

(H) Calibrated Circular Level. Ceramic level with 5/16" dia. circle & crosslines. Sensitivity: 10 mins./0.1". Size: 1¾" dia. x ⅝" high. Three 0.120" holes on 1.5" dia. bolt circle.
No. 42,763 $15.95

(I) Blades for Florists & Handymen. Disposable, sharp, 2", 5" w/handle. Pkg. of 50 **No. P-70,369 $7.95**
2 or more pkgs. of 50. $6.95 each.

Dremel Tools

(J) Super Compact Dremel "Moto-Tools." Grinds, drills, polishes & sands. Versatile palm-size unit has permanent magnet motor. 3-conductor cord, 115 V, 60 Hz, AC/DC. Each kit has 0.8 amp "Motor-Tool", 7 grinding wheels, 3 bristle brushes, 2 mandrels, 1 collet, check wrench, drum sander w/2 sanding bands, 2 felt polishing wheels, drill bit, steel cutter, sanding discs, hi-impact plastic carrying case & instr. 5,000–25,000 rpm. **No. 1651 $69.95**
Drill Press. Adj. stage. Locks at any height. Accepts above tools. Ht. 12". **No. 1607 $29.95**

(K) Hemostat Surgical Pliers . . . Many industrial uses including electronic heat sink & micro-miniature clamping. Jaws lock closed—free hands. 2 tip sizes avail. Tip A for extra small work.
5" Hemostat, Tip A No. 40,570 $6.95
5½" Hemostat, Tip B No. 40,571 6.95

4¾" Dressing Scissors. Disposable with 1" cutting edge. Pkg. of 6. **No. P-42,675 $4.25**

(L) Complete Hobby Spray Gun Kit . . . Includes: 115 V AC, 60 Hz oil-less, palm-size, 40 psi minicompressor; adj. spray-gun; air hose w/standard fittings; two 1 oz. jars & one 2 oz. jar. Perfect for sign art. **No. 72,383 $69.95**
Spray Gun Only: Includes 8 ft. air hose, jar. Fits all compressors. **No. 61,164 $14.95**

Tungsten Carbide Drills For Glass. Made in England. Efficiently drills holes in glass—glazed tile. Nickeled shanks, ½" dia. or smaller, except ½" spear point has 5/16" shank. Each size marked. Instructions included.

1/8"	No. 41,517 $3.95	5/16"	No. 41,520 $5.95
3/16"	No. 41,518 3.95	3/8"	No. 41,521 7.95
1/4"	No. 41,519 4.95	1/2"	No. 41,522 7.95

Carbide Scriber for engraving on glass, See No. 40,594.

(M) 20-Piece Micro Drill Set. Quality carbon steel drills No. 61 to 80 in indexed plastic case, 20 drills from 0.013 to 0.039". **No. 41,941 $15.95**

(N) Deluxe Table-top Wood Turning Lathe . . . Turn wood, plastic, & soft metals up to 6" x 1½" dia. into model parts, art objects & more. 3450 rpm, 115 V AC, 60 Hz motor lathe (15¾x6x4¼"), 4 hardened steel chisels, 12 hardwood dowels, face plate, wood screw drive center, honing stone. **No. 72,396 $89.95**

On Site Drafting Kits. Drafting machine, drawing board & one-piece vinyl binder. Includes triple duty machine: T-square, triangle & 360° protractor. 4x6" scale calibrated in 1/10th's. 8½x14" pad & pencil. 2 lbs.
No. 72,228 $24.95
Metric scale accessory. No. 61,216 7.95

New Larger 16 x 21" Drafting Kit. 6x9" scales for drawing up to 12x18". Machine is removable. Use for optical ray tracing & more. **No. 72,427 $36.95**
Metric scale accessory No. 61,217 10.95

(O) Paramatic Drafting Set Ends Need For T-Squares!! Invisible T-square aligns & guides triangle on smooth vinyl drawing surface. Horizontal magnetic tracks built into the board! Incl.: paramatic drafting board (13x21"), two 11" 30/60° triangles & paramatic line guide (1x3").
No. 72,479 $49.95

Table Top Speed Control. Solid state. Adjusts speed of Moto-Tool or Moto-Flex Tools from 0–full rpm at twist of a dial! Exacting control of all UL approved tools up to 5 amp. Incl. overload protector fuse, reset button, grounding plug & non-slip base. 120 V, AC, 50/60 Hz, 5 amps Max. (600 W). Accepts double insulated & 3-wire tools. Not for use w/induction motors. **No. 61,240 $23.95**

Dial Vernier Calipers. Takes inside, outside & depth measurements. Guaranteed accurate to 0.001". Beam graduated in inches & 1/10". 6" capacity jaws. Lockable thumb roll fine adj. w/slipping feature to prevent forced readings. 9"x3", stainless steel w/chrome finish.
No. 61,089 $74.95

Inexpensive 5" Vernier Caliper . . . Inside & outside jaws, depth gauge, roller adj. Graduated 1/16"–5", 1–120 mm. Reads to 1/128", 0.1 mm. **No. 40,598 $6.95**

Student, English Metric Micrometer. Reads to 0.01 mm. Adj. anvil. 0–25 mm capacity. Instructions included. Great for beginners. **No. 41,428 $9.95**

Precision English Micrometer Caliper With Carbide Faces. Measures 0–1"; accuracy 0.0001"; parallelism to 0.0005". Vernier scale on barrel numbered every 0.0001"; thimble scale in thousandth, numbered every 5. Adjustment nut, locking clamp, 5½ oz. built-in ratchet-lock wrench, case. **No. 60,524 $38.95**

Student English Micrometer . . . reads to 0.001". Adj. anvil. 0–1" capacity, accuracy 0.001". **No. 60,666 $9.95**

Gear Assortment . . . 16 quality, brass, nylon & steel spur gears; from 5/16" to 1¼" dia. 24, 32, 48 pitch. For mechanical motion projects. **No. 60,352 $1.95**

7" Stainless Steel Forceps. American made by LaCross. Rounded tips w/inside serrations. **No. 42,674 $3.50**

Micro Screwdriver Set . . . top quality, 10-piece set. Swivel tops, no-slip, knurled shafts, tempered steel blades for precision work. Blade width: 0.6–3.8 mm (0.024–0.15"). **No. P-41,671 $9.95**

Stainless Steel Instrument Set. 9 instruments. Miniature scrapers, waxing tools, probes & chisels. Originally intended as dental instruments. Recommended for delicate work with difficult materials. **No. P-42,796 $38.95**

Complete Selection of Scribers . . . write on metal, glass, gems & plastic. Protect your valuables.
Carbide Scriber. 5½" long; pocket clip; magnetized top retrieves parts. **No. 40,594 $2.75**
Replacement Tip. No. 40,595 1.00
Diamond Tip Scriber. 5¼". **No. 61,048 5.95**

New Dual Tip Scriber! Carbide & diamond tip in one compact pen-type case. 5½". **No. 61,080 $9.95**

Tools

(A) All-Purpose Ceramic Adhesive Kit. For high temp. bond strength; electrical resistance; bonds ceramics to ceramics. Assembly bonding, insulating & potting. Includes adhesives. An unlimited range of materials can be bonded for use at up to 3200°F. These adhesives offer excellent, high temp. stability & dielectric strength. Resistant to molten metals, oxidizing & reducing atmospheres, most chemicals & solvents.

No. 42,708 $27.95

Insulate With Ceramic Paper Kit. Lightweight ceramic paper offers high dielectric strength & resistance to molten metals. Asbestos-free, yet has 3X insulation properties of asbestos. Cut, fold, even wrap around sharp corners. Ideal for high temp. apps. & electrical insulation. Low thermal conductor. Melts at 3200°F; offers continuous service @ 2300°F. 8' long, 1/32" thk. paper. 4 oz. jar of adhesive. Instr. **No. 71,920 $16.95**

(B) Electroplate Metal Quickly & Easily.
Restore scratched, worn or rusted areas in minutes. Kits make it simple to electroplate with gold, chrome, brass, black gloss by brush-on or dip-coating procedures. Non-cyanide process. Includes 1 brush & dip-coater heads with anodes, battery cases, electrolyte metal polish or conditioner, wire clip & complete instr. Your choice of 5 pure metal coatings & black gloss. Enough to do 100 sq. in., one coat. Dries instantly.

	Electroplating Kits		Refill Kits	
Set	Number	Price	Number	Price
Silver	61,003	$21.95	42,018	$12.95
Gold	61,004	39.95	42,019	20.95
Chrome-like	61,005	19.95	42,020	9.95
Copper*	61,007	19.95	42,022	9.95
Black Gloss	61,008	20.95	42,023	9.95
Brass	61,041	18.95	42,156	9.95

Metal Polish. 4 oz. jar of preplating/cleaning polish for all metals. **No. 42,190 $2.95**

Cover Cote. 2 oz. of peelable lacquer for masking areas not to be electroplated. **No. 42,303 $2.95**

Make Old Bumpers Look Like New! Instant brush-on electroplating kit. Includes electrobrush, plating solution, batt. leads, buffing wheel, metal polish, grinding wheel, instructions. Uses any 12 V batt. Wt. 3 lb.

No. 71,950 $49.95

"Steel-It" Stainless Steel Coating. Stainless steel flakes of iron nickel & chromium alloy provide durable layer which resists staining, tarnishing & chemicals. Use on metal items around the house as well as car parts. 1 qt. size. **No. 61,208 $11.95**

High Temperature Steel-It. **No. 61,209 13.95**

High Temperature Tape. Non-stick surface, mechanical abrasion resistant. Great for making instrument slides, covering saw tables & handling hot plastics, where sliding, high temperatures or non-stick properties are required. **No. P-42,707 $12.95**

(C) Build Heavy-Duty Ball Bearing Turntables.
Make heavy duty turntables to 60" dia. for wts. to 1,000 lbs. Also makes variable density polarizing filters. Heavy gauge zinc plated steel, precision balls fill deep ball races. 3/16" thick for stable, smooth operation. Screw holes offset so load bearing sections clear each other.

Number	Plate Size	Center Hole	Turntable Size To	Load Lb.	Wt. Oz.	Price
40,600	3" sq.	1 9/32"	18"	200	3½	$1.20
40,601	4" sq.	2⅛"	25"	300	6	1.50
40,602	6⅛" sq.	4 11/16"	30"	500	10	1.95
60,327	12½" md.	6 5/16"	60"	1000	30	4.50

(D) Polyethylene Gloves . . . protect hands & handled material from harmful or dirty substances. Solvent, chemical & detergent resistant. Pkg. of 100.

Medium **No. P-60,317 $3.95**
Large **No. P-60,321 3.95**

Disposable Plastic Cups . . . for mixing & measuring. Crystal clear plastic. 1 oz. size marked: in., cu., cms., ml., tsp., tbs., oz. & drams. Smooth beaded lip. 6 oz. size marked: cc. & ml. Won't tip, non-spill pouring lip.

1 oz. size. Pkg. of 100 **No. P-60,365 $ 2.75**
6 oz. size. Pkg. of 100 **No. P-70,625 11.25**
1 oz. size. 4 or more pkgs. **$2.50 ea.**
6 oz. size. 4 or more pkgs. **9.75 ea.**

(E) Over 48,500 Precision Mechanical Components Now Available From The Berg Catalog. Perfect for limited quantity production requirements. You'll find components for high speed printers, copy machines, electronic typewriters, digital readout drives & much more. Order your copy today! A must for engineers, designers, draftsmen. **No. 9571 $2.00**

(F) Super Glue . . . One Drop Holds A Ton!!!
Sets in seconds! Bonds rubber, plastic, wood and more. Requires no solvents, catalysts or heat. Mend china; bond silicone chips to ceramics; attach metal to glass; fix parts for riveting. Tensile strength to 5,000 lb./sq. in. Non-toxic.

2 gram tube. **No. 41,508 $1.95**
1 oz. bottle. **No. 41,509 8.75**

Super Glue 5-pack. (5) 2 g. tubes. Longer shelf life; use 1 tube at a time. **No. P-42,107 $8.95**

Modeling Plastic Stays Soft Until Baked.
Ideal for industrial designers. This white "plastic" material stays soft, hardening only when it's baked. Smooth, nonsticky & self-structuring. Won't stain or stick to skin. No kiln or plaster molds are necessary. Bake at 325°F for 15–30 min.: acquires a permanent, non-brittle hardness. Can be sanded, carved or drilled. Non-toxic, colors easily with waterbase acrylics. Instr.

2 lb. pkg. **No. 60,794 $ 4.95**
8 lb. pkg. **No. 71,205 15.95**

Latex Rubber Mold Compound. Paint it onto almost any object you wish to duplicate in detail. Produces fine molds for use with expandable foams or plaster. 1 qt. Instr. **No. 42,446 $9.95**

(G) Super Foam . . . Fill & Seal Gaps . . . Soundproof Rooms. Expands to a rigid mass 30X original volume. Liquid resin, easy to use. Simply mix equal amounts from cans A & B. Pour & spread. Rapidly hardens within 5 mins. Use it for plastic molds, too; then carve or paint. Instructions detail many projects. Becomes a brownish, rigid, lightweight, waterproof, heat & cold resistant, erosion-proof mass. Works best @ room temperature.

2 can set. **No. P-71,876 $12.95**
Gallon Size. Makes 8 cu. ft. **No. 85,263 59.95**

Insta-Foam™ . . . Urethane foam in a single pressurized container . . . no mixing or blending. Fills & seals gaps. Complete w/2 dispensing nozzles. Dispense foam intermittently within 20 sec. intervals. 18 oz. pack yields 0.75 cu. ft. of foam. **No. 72,128 $19.95**

(H) Fomofill™ . . . Insulates Against Heat Loss. Semi-rigid filler has excellent adhesion & chemical properties. Home insulation & boat repairs. **No. 61,166 $11.50**

(I) Pickproof Magnetic Lock With No Keyhole.
This could be the most significant advance in locks in the past 100 years. It has a series of internal magnets & quick-use magnetic "key". No keyhole, so it's pickproof. To open in a second, place "key" in the slight depression on the lock's side. No other magnetic key can open the lock. Bright silver finish, heavy duty constr. Includes 2 "keys", wire ring and instructions. 2¾x1½x5/16". Wt. 8 oz. **No. 42,017 $6.95**

Surplus Hardware "Hard-To-Find-Items. This material, all new, was procured from the world's largest dealer in "surplus" industrial hardware. Much of it is expensive "AN" and "MS" grade. Each kit represents a value impossible to find elsewhere. **$8.50 Each.**

Small Machine Screws and Nuts. About 500 pcs. **No. P-72,036**
Tinnerman Clips (500 pcs.) **No. P-72,037**
Precision Instrument Bearings (10) **No. P-72,039**
"O" Ring Mix. (200 rings) **No. P-72,040**
Lock Washer Mix (1000 pcs) **No. P-72,043**
Sheet Metal Screws (2 lb. assort) **No. P-72,045**
Small Spring Mix (25 sizes) **No. P-72,046**
Aircraft Screw & Stop Nut Mix (400) **No. P-72,047**

120 Piece Spring Assortment. Small compression, extension & torsion springs of various sizes & tensions. 30 springs, 4 of each. 1st quality. **No. P-70,860 $13.50**

Other Aids For Your Shop . . .

Specialty Mirrors . . . . . Page 78
Magnets . . . . . Page 29
Magnifiers . . . . . Page 44
Fiber Optics . . . . . Page 67

3-in-1 Aluminum Stack Case. Sturdy, lightweight carrying case. Superb for transporting & storing cameras, lenses, optical accessories, tools. Rugged construction; tarnish-resistant aluminum finish. Protective Styrofoam lining for complete protection against dust, moisture & shock. Stack Case lid is easily removed; fits all 3 interlocking compartments. Detachable shoulder strap.

Cases	Size (mm)	Number	Price
Lid	424x230x85	80,316	$ 65.95
Top Section	424x230x105	80,317	67.95
Mid Section	424x230x135	80,318	72.95
Bottom Section	424x230x195	80,319	77.95
Complete Set	424x230x490	80,320	239.95

Lasers

Quality Helium-Neon Lasers

• All lasers include power supply. Edmund Scientific continues its tradition of making the finest quality instruments available. These precision Spectra-Physics and/or CW Radiation Helium-Neon Lasers* are equally designed to provide superb performance & years of dependable operation. Each has excellent warm-up characteristics, precise beam alignment & stable output power. Safe, cost-effective & maintenance free, they're reliable laboratory tools. Each emits red light of 632.8 nm wavelength. The 0.5 mW laser has operating temp. range of +10° to 40°C. The 2.0 mW lasers have operating temp. range of −20° to 55°C.

*Spectra-Physics or CW Radiation Lasers shipped depending upon availability.

(A) 0.5 mW Rectangular Laser. Safe, low-power; suitable for classroom demonstrations. It can be used in any experiment requiring a coherent single frequency light beam, low power level & non-critical mode operations. Perfect for holography demonstrations, ray tracing, interferometry & general alignment of mechanical set-ups. Class II laser system output power will never exceed 1.0 mW. **No. 79,092 $210.00**

(B) 5.0 mW Cylindrical Laser. The state-of-the-art in HeNe encapsulated lasers! High power, high tolerance model achieves a remarkably precise light beam. Its lightweight cylindrical head design can be readily incorporated into optical systems. For lab & research applications, it emits red light of 632.8 nm wavelength in a precise beam. Remote power supply. Built to withstand higher shock & vibration levels than normally encountered in industrial use.

No. 79,103 $725.00

(C) 2.0 mW Cylindrical Laser. General purpose higher-power laser for industrial applications, it features a cylindrical head design that makes it ideal for ring mounting and "vee" blocks. Encapsulated head is coupled to a table-top power supply w/6' cable making it ideal for optical centering devices, product code scanners & construction levels. Remote power supply accepts 115/220 V AC, 50–60 Hz. **No. 79,093 $525.00**

(D) BRH warning logotype "Caution" is attached to No. 79,092 only to certify output power will not exceed 1.0 mW limit stated.

(E) BRH warning logotype "Danger" is attached to lasers Nos. 79,093 & 79,103 to certify output power will not exceed the mW rating stated on each laser.

"Laser Art & Optical Transforms". Filled with photographs & illustrations: 242 photos, 143 line drawings! Describes unique lighting & pictorial effects obtainable with laser light. Features laser light concerts, holography & more. 170 pages. **No. 9583 $12.50**

"Laser Fundamentals & Applications" by Hrand M. Muncheryan. Basic laser concepts and their applications in medicine, industry & the military. Mathematical formulas & illustrations. 192 pp. Paperbound.

No. 9522 $6.50

Precision Pinholes. Each set contains 1 pinhole per piece in a specific range. Sorry, no selection within ranges. Accuracy: 1–24 u, ±0.5 u; 25 u & up, ±2%.

Set	Range	Number	Price
A	2-5; 6-9; 12-18; 19-24	41,480	$89.50
B	25-40; 41-75; 76-120; 121-200	41,481	79.50

Metal Mounts For Pinholes. Convert pinholes to 2x2" mounts. .075" thk. w/center holes tooled to accept the .625" dia. pinhole metal discs. **No. 30,607 $7.50**

Individual Precision Pinholes. Control apertures of light beams, laser beams. Blackened metal foil. Mounted in 0.625" dia. metal disc. Fits metal mounts below.

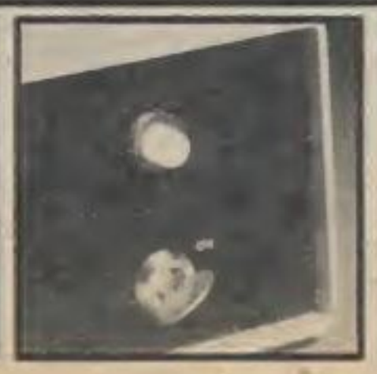
Dia. in microns	Number	Price
1 (±0.5 u)	30,604	$49.50
10 (±1.0 u)	30,605	29.50
25 (±1.0 u)	30,606	29.50

Laser Filters. Center wavelgth. tolerance of ±2 nm, blocking range: far UV to far IR, bandwidth tol. of ±1.5 nm.

Specifications

Wavelength	$11.95 ea.	$12.95 ea.	$39.50 ea.	nm	%	Comments
nm	½ x 1	¾ x ¾	25mm	H.B.W.	Trans.	
457.9	30,900	30,903	30,906	6.8	45	Use w/Cadmium Laser
488.0	30,692	30,708	30,907	7.2	45	Use w/Argon Laser
514.5	30,694	30,710	30,908	8.0	50	Use w/Argon Laser
532.0	30,901	30,904	30,909	8.6	50	Use w/YAG Laser
632.8	30,701	30,717	30,910	11.1	50	Use w/He-Ne Laser
694.3	30,739	30,745	30,911	12.4	45	Use w/Ruby Laser
1064.0	30,902	30,905	30,912	15.2	45	Use w/YAG Laser

Specifications	Rectangular Lasers		Cylindrical Lasers Remote Power Supply			
	Spectra Physics	CW Radiation	Spectra Physics	CW Radiation	Spectra Physics	CW Radiation
Number	79,092		79,093		79,103	
Power, TEM_{oo}	0.5 mW	0.5 mW	2.0 mW	2.0 mW	5.0 mW	5.0 mW
Polarization	Random		Random		Random	Linear (500:1)
Noise	0.3%	1%	0.5%	0.5%	0.5%	0.5%
Ripple	0.5%	0.1%	0.1%	0.1%	0.1%	0.1%
Drift	±2.5%	±3%	±3%	±3%	±3%	±3%
Beam Diameter	0.88 mm	0.64 mm	0.5 mm	0.67 mm	0.9 mm	0.85 mm
Beam Divergence (Full Angle)	1.0 mrad	1.3 mrad	1.7 mrad	1.2 mrad	1.0 mrad	0.96 mrad
Size—Head	67x88x376 mm	89x108x227 mm	35x286 mm	28x241 mm	44x413 mm	38x600 mm
Size—Power Supply	Included in head	Included in head	87x190x253 mm	89x108x335 mm	87x190x253 mm	89x108x335 mm
Input Power	22 W	Max. Current 0.5 Amp	23 W	Max. Current 1 Amp	30 W	Max. Current 1 Amp
Input Voltage	115 V AC	110 V AC	115/220 V AC	115 V AC	115/220 V AC	115/220 V AC
BRH Class	II	II	III b	III b	III b	III b
Longitudinal Mode Spacing	550 MHz	865 MHz	641 MHz	645 MHz	400 MHz	425 MHz



Helpful Accessories Expand Laser Values

(A) Uni-Pivot Gimbal Mount keeps adj. problems to a minimum! Range: ±15° about 2 perpendicular axes in vertical plane with 30 sec. of angle resolution. Pivot ball has ½" hole, allowing light beams under ¼" dia. to pass through any secured transparent optics. Has #6-32 tapped holes; ⅜" center hole in ⅜" thick mounting plate can be reworked to 1". Anodized alum. 5"x2⅜"x3". Center of gimbal aperture approx. 3$^{5}/_{64}$" above bottom of plate. 1 lb. 7 oz. (0.65 kg.). **No. 60,816 $59.95**

(B) Adjustable Laser Carrier. For mounting lasers to triangular optics benches at appropriate modular height above bench. Moves laser up, down, sideways or rotates about a vertical axis. Fine screw adj. 2¾"x3"x 11½" **No. 71,552 $49.95**

Optical Bench . . . for mounting accessories, optical systems, etc.

1 meter	**No. 83,008**	**$ 59.50**
2 meter	**No. 83,018**	**119.50**

Pin Carriers fit above optical bench and hold accessory pins.

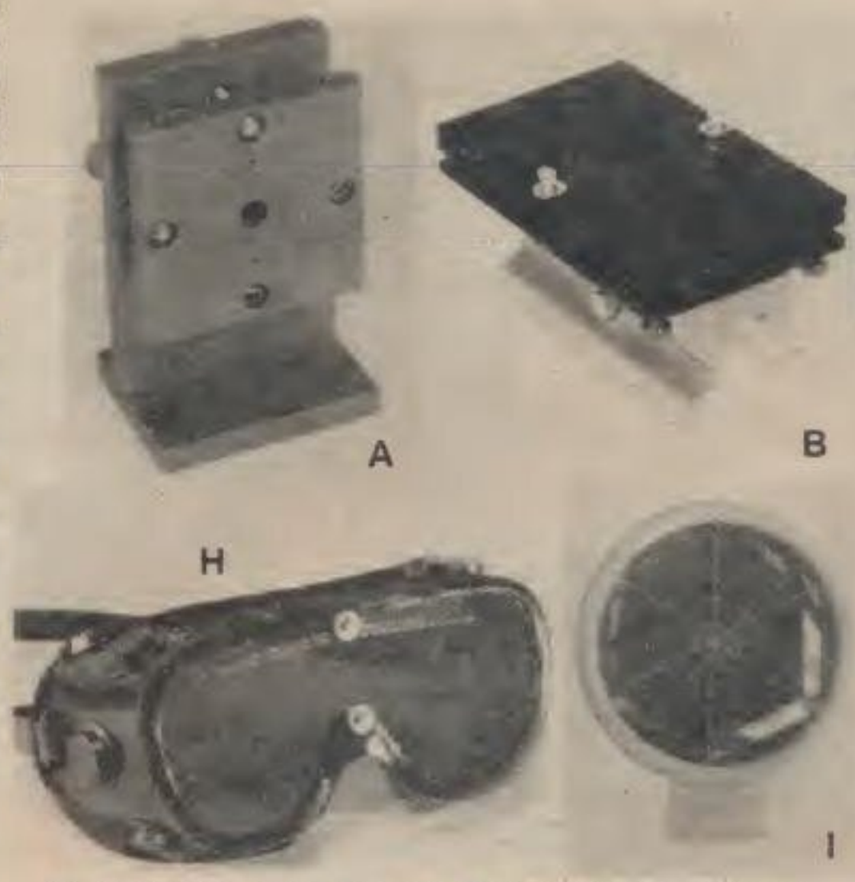
(C) 30 mm Carrier	**No. 60,823**	**$15.95**
(D) 60 mm Carrier	**No. 60,796**	**16.95**
(E) 90 mm Carrier	**No. 60,824**	**16.95**

(F) Mounting Pin fits on pin carrier & holds accessories. **No. 41,229 $11.95**

(G) Universal Connecting Base. Make linear or angular arrangements for 2 or more optical benches. Useful in setup for holography. Metal: 6"x10"x¼" Adj. screws and T-nuts included. **No. 71,551 $24.95**

(H) Laser Safety Goggles: Protect your eyes with high-quality laser safety goggles—a necessity in research & many industries, especially those involving lasers. For use with Helium-Neon lasers of 1 mW; frequency attenuation over 1000 @ 6328 A° without seriously impairing visibility. Soft vinyl frame w/6 air vents, blue-green lens, adj. headband. **No. 60,854 $28.50**

WARNING! If improperly viewed, even low output lasers can cause eye damage.

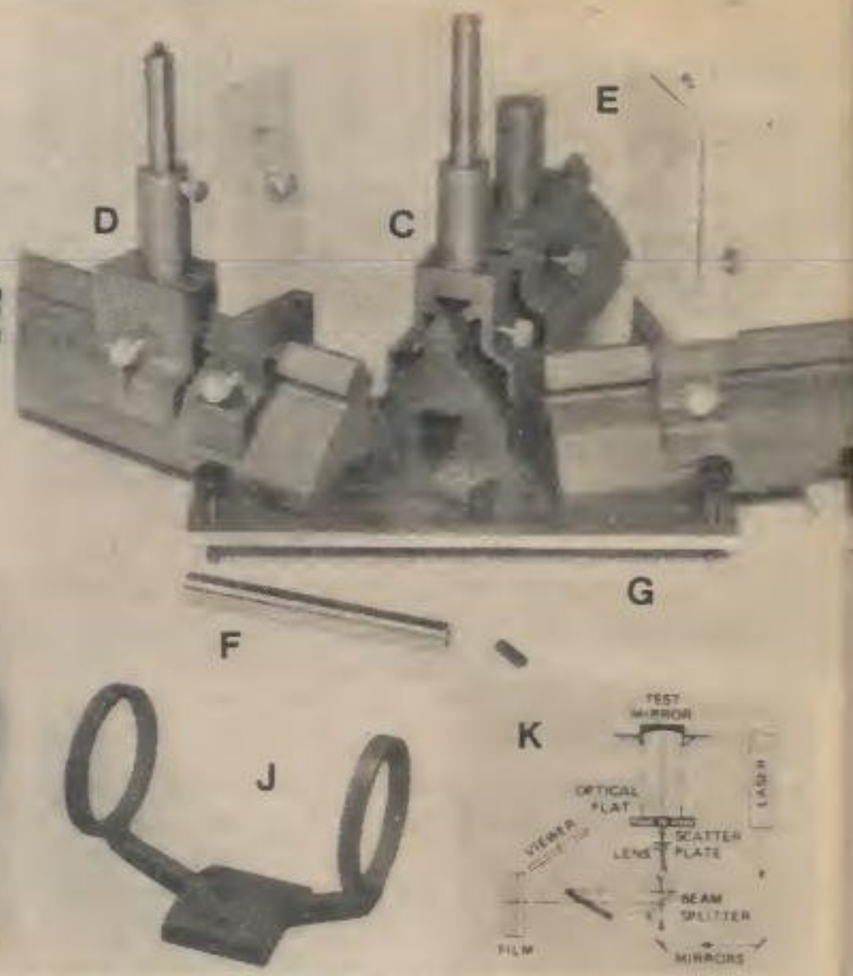


(I) Low-Cost, High Quality Retroreflectors. Rugged shock mounted in pre-drilled housing with ¼-20 hole. Incorporates 3 optical flat mirrors accurately perpendicular to ultra precision specs; without cover glasses for use with I.R.

(J) Universal Ring Mount. 2⅞" dia. rings spaced 5¾" apart. Each contains 3 machine screws 120° apart. Useful with telescopes & lasers. Tapped for ¼-20 post. **No. 71,791 $13.95**

Super Low-Cost Retroreflector. 1" aperture exceeds 2–5 min. accuracy. **No. 42,388 $39.95**

High Energy Model. 5" aperture; accuracy as above, but energy rate incr. 25 X. **No. 72,273 $139.95**



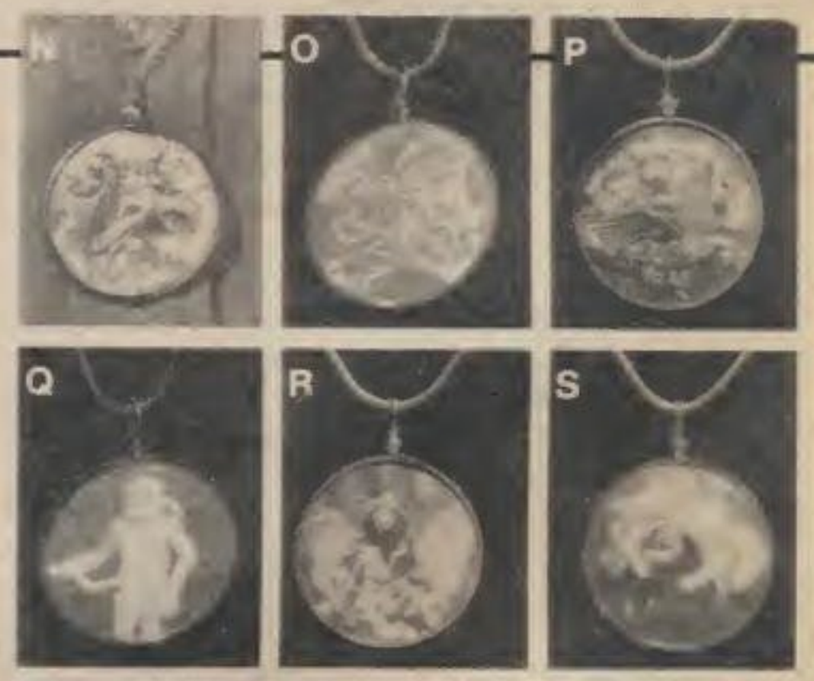
Interferometry Model for Critical Work. 1–5 sec. incoming to outgoing accuracy, 1½" aperture. Selected for precision lab work. **No. 42,390 $119.95**

(K) Scatter Plate For Laser Interferometry. With this scatter plate element you can build an equal path interferometer. Mounted in an X-Y Positioner like our No. 30,058 on page 41, and held in place by our No. 71,525 Focusing Tube on page 71, true wave front error of a mirror can be tested to better than $1/_{20}$ of a wavelength of helium-neon laser light (632.8 nm). Best used with laser illumination, it can also be used with white light. Includes setup diagrams. It has an apparent f/ratio of approx. 4 and an active aperture of ¾" dia. 2"x1"x0.03" thick. **No. 30,782 $69.95**

Holography

Mounted as pendants on 24" long gold-colored chains, they are sure to spark attention. Made with a newly developed process, dichromatic holograms are illuminated by normal ambient light—no special setup needed to enjoy their fascinating images. 44.5 mm dia. disc is made by illuminating dichromatic gelatin with a laser light image, then laminating it between glass.

(N) Watch Face & Parts	**No. 30,781**	**$19.95**
(O) Butterfly	**No. 42,683**	**19.95**
(P) Eagle	**No. 42,523**	**19.95**
(Q) Spaceman	**No. 42,684**	**19.95**
(R) Nymph	**No. 42,522**	**19.95**
(S) Rose	**No. 42,521**	**19.95**



What is Holography?

Holography is an apparent 3-dimensional imaging technique that utilizes laser light. A hologram is actually a photograph of the light waves that are reflected by a laser-illuminated object.

Unlike normal 2-dimensional photographs, a hologram records all of the reflected rays of light that come from the original object. When illuminated by laser light, or even by white light in some instances, a hologram recreates the original object in 3 dimensions. Viewed from different angles, the image looks so real you believe you can almost touch it. That's because holographic images have the same apparent physical characteristics—size, dimensions, volume & space—as the original object. Conventional transmission & projection image holograms may be viewed with a laser or with a slide projector & a monochromatic filter. Our Dichromatic Hologram Discs, Spectrol® Holograms & Multiplex Moving Holograms can be viewed with normal ambient light or a regular Tungsten lamp.

(L) New!!! Dichromatic Belt Buckle Hologram.
Beautiful—Eyecatching—Intriguing. This 3-dimensional image of a golden rose, set on a smart looking, golden belt buckle will add that special, intriguing touch to the well dressed person. Catch every eye at the Disco.
No. 42,802 $18.95

(M) New!!! Dichromatic Framed Hologram Rose.
Cheer up your office or home with this framed rose hologram. This 3-dimensional image of a golden rose looks so real that you'll be tempted to pluck it. 1¾" sq. frame. **No. 42,801 $18.95**

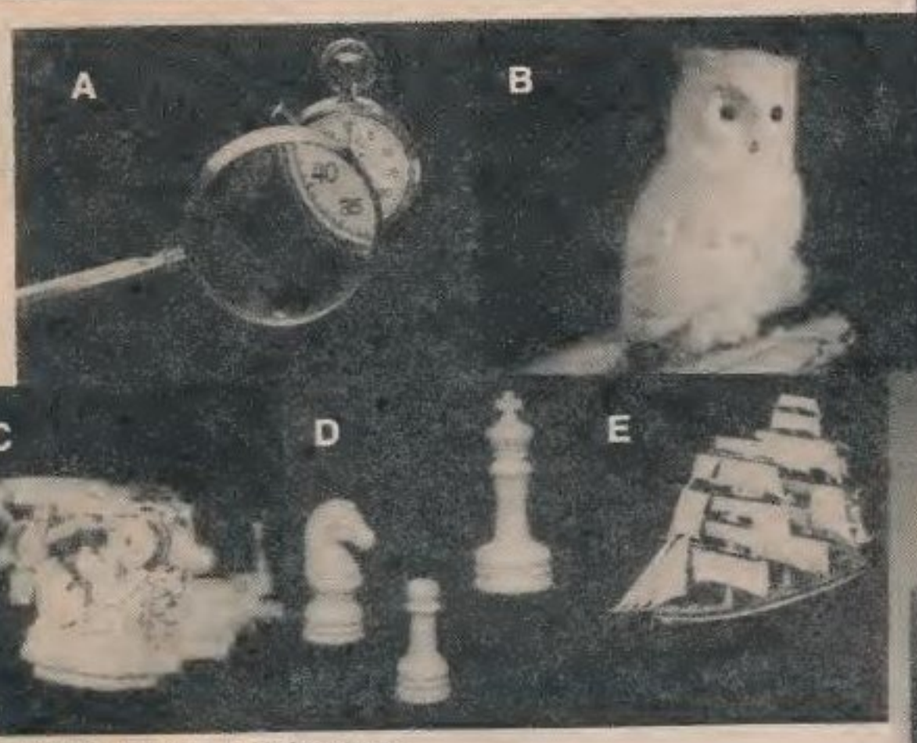
New Dichromatic Hologram Discs—The brightest holograms you've ever seen! Attractive and intriguing, these shimmering images are great jewelry & gift items.

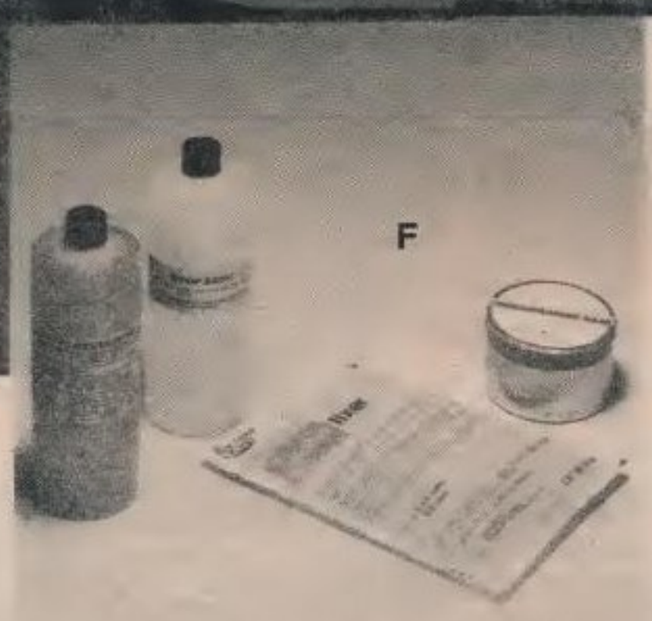
The Spectrol® Holograms
3 Dimensional Sunlit Images

These holograms can be illuminated by ordinary light bulbs or sunlight! Affixed to a sunny window, they even act as diffraction gratings—throwing vivid color projections into a room. Fascinating to watch, they undergo color change and image shifts as the angle of view & sunlight change. Each is cardboard framed.

(T) The Prophet (8½x8½")	**No. 61,130**	**$22.00**
(U) Seagull Hologram (4½x4½")	**No. 42,685**	**10.50**
(V) Hologram Cubes (4½x4½")	**No. 42,456**	**10.50**

(W) Image Aeroplane Hologram.
This exciting hologram is also called a "projected real image" hologram. The aeroplane appears to be flying toward the viewer, as the nose is projected just out in front of the plate. Can be illuminated by projector or 200 W light bulb. 4½x4½" in size; framed acetate. Filter included. **No. 42,106 $7.50**





New!!! Flat Integral Holograms
Space age technology has now made holograms into an art form! Suspend a colorful, hypnotic, 3-dimensional image from the wall of your office or home. The Hologram display unit has its own light source so you can hang it almost anywhere. The flat integral image plates are removable so you can display a different image every day.

Display Unit:	**No. 80,305**	**$74.95**
Flat Integral Venus	**No. 72,485**	**34.95**
Flat Integral Movie Theater	**No. 72,486**	**34.95**
Flat Integral Molecule	**No. 72,483**	**34.95**
Flat Integral Gladiola	**No. 72,484**	**34.95**
Flat Integral Clown	**No. 72,487**	**34.95**

Large Selection of Transmission Holograms Only $7.50!
Transmission holograms reconstruct an image which appears to be behind the hologram. The image is seen by looking through the hologram as though it were a window. All are 4½x4½" framed acetate and super bright! Filter included.

	$7.50 Each.
(A) Watch and Magnifier	**No. 42,010**
(B) Owl	**No. 42,687**
(C) Engine	**No. 42,686**
(D) Chessmen	**No. 40,969**
(E) Sailing Ship	**No. 42,150**
Men On the Moon	**No. 42,688**

(F) Complete Holographic Mini-Lab
A simplified optical system engineered to provide an easy operation, hands-on experience for students with minimal instructor preparation. Contains all required components including diffuser, mounted reference mirrors, a magnetic film holder as well as all the necessary film & chemicals required to make up to 50 (70x70 mm) holograms. Optical components secure to sturdy, padded table to minimize vibration. Lab features our new He-Ne demonstration laser described on page 83. A BRH Class II laser, it has 0.3 mW minimum; 1.0 mW maximum power that makes it ideally suited for classroom demonstrations. Kit includes full instr. on all phases of the holographic process & laser operation.

	No. 79,091	**$399.00**
Mini-Lab Without Laser	**No. 80,255**	**195.00**

Holographic Film And Chemical Kit. Intrigued by 3-D pictures? With your laser, holographic equipment and this kit, you can make your own holograms. Designed for beginners, it has sufficient materials to make 50 holograms! Incl.: fixer, print developer, stop bath w/indicator, enough film for 50 holograms (70x70 mm) and instructions. **No. 71,335 $59.95**

Multiplex Holography-Moving Images of The Future. This exciting new technique combines conventional 35 mm movie photography with laser holography to produce a 3 dimensional moving image which is reconstructed with light from a 110 V light bulb. Only yesterday photography & laser technology combined to produce a new dimension, the 3rd dimension in photographic images. Now this same technology has leaped years ahead with multiplex holography. Each full color hologram is complete with its own display case (approx. 13"h x 9"dia.), light fixture, instr. & description of multiplex holography process. Light bulb needed.

(G) The Moving Kiss. The girl in the hologram actually winks & blows you a kiss as you move in an arc of 120°. **No. 72,221 $99.95**

The Train. Powerful locomotive comes charging out of the tunnel at you. **No. 72,482 $99.95**

NASA Shuttle. Artist's rendering of NASA Shuttle approaching Earth. **No. 72,447 $99.95**

King Kong. Lord of the Jungle takes on airplanes atop Trans-American Bldg. **No. 72,312 $99.95**

YOU HAVE A CHOICE! We occasionally make our mailing lists available to carefully selected companies whose products/services may be of interest to you. This is one way to provide another service to our valued customers. If for any reason you do *not* wish to receive mailings from these companies, write our Mail Preference Supervisor. See Page 50-B for details.

Stabilize Holographic Tables With Heavy-Duty Balloons. These rubber balloons have proven quite useful in steadying tables for holography. This is essential for best results! Pkg. of 4. **No. P-71,184 $5.95**

Interference Filter For Holography
High quality passband interference filter with a 577.0 nm wavelength. Perfect band for viewing holograms. H.B.W. 9.8 nm; 50% transmission.

½" x 1"	**No. 30,697**	**$11.95**
¾" x ¾"	**No. 30,713**	**12.95**

"Guide to Practical Holography" by Outwater. Basic information on setting up your own lab, techniques, etc. Also chapters on lasers, interferometers and isolation tables. 8½" x 11", 62 pp. Paperbound. **No. 9482 $14.95**

All New!!! Cylindrical Hologram.
A Moving 3-D Image. At Last! The marriage of the ultra-modern, space age technology of 35 mm movie photography to laser holography has produced an incredible, life-like, moving 3-D image. Each cylindrical hologram rotates on a sturdy base while you relax and watch a beautiful, full-color, moving show in 3-D! View the image from any direction. It's gorgeous to watch and intriguing to contemplate. Made of clear, sturdy plastic, the hologram stands 23" high and is 16" in diameter. Complete with attractive motorized display unit which uses a 100 W bulb, mounted on a decorative black base.
Hologram Display Unit **No. 80,301 $129.95**

360° Holograms
(H) "Created & Consumed" by Fire. A beautiful Oriental dances in fire-bright atmosphere.

	No. 80,302	**$329.95**
NASA Space Shuttle	**No. 80,303**	**329.95**
The Disco	**No. 80,304**	**329.95**

NEW! H

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T.V. Projection Lens

A

Build Your Own Custom TV Projection System

With The Edmund 5″, 13.5″ f.l., f/2.6 or 12″ f.l., f/2.4 Super Projection Lens at ⅓ to ¼ the cost of today's popular complete systems!

Featured in "Mechanix Illustrated"

We Now Offer A Brighter Lens, 12″ Focal Length

Ideal Optics For:

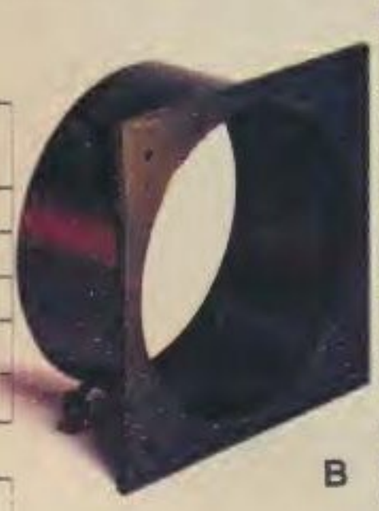
- **Custom TV projectors**
- **Opaque & overhead projectors**
- **Disco special effects projectors**
- **Visual data terminal projectors**
- **Bi–ocular inspection magnifiers**

Typical Projection Data
5″ dia., 13.5″ f.l., f/2.6 lens

TV screen Diagonal	30″ x 40″ Screen size "a"	"b"	Magnification	40″ x 54″ Screen Size "a"	"b"	Magnification
9″	12.6″	95″	6.2x	12.1″	119″	8x
12″	13.3″	74″	4.7x	12,7″	92″	6x
13″	13.6″	69″	4.3x	13.0″	82″	5.3x
15″	14.1″	61″	3.7x	13.2″	76″	4.8x
17″	14.5″	55″	3.3x	13.6″	67″	4.2x

5″ dia., 12″ f.l., f/2.4 Lens

TV screen Diagonal	30″ x 40″ Screen size "a"	"b"	Magnification	40″ x 54″ Screen size "a"	"b"	Magnification
9″	10.9″	84″	6.2x	10.5″	105″	8x
12″	11.6″	65″	4.7x	11.0″	81″	6x
13″	11.8″	61″	4.3x	11.2″	73″	5.3x
15″	12.2″	54″	3.7x	11.5″	67″	4.8x



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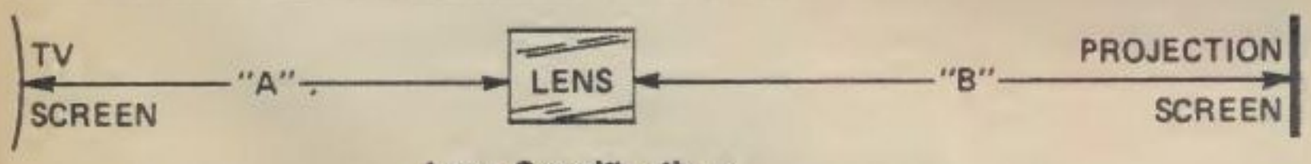


Lens Specifications

	For 13.5″, f/2.6 Lens	For 12″, f/2.4 Lens
Aperture:	5″	5″
f/ratio:	2.6	2.4
Focal Length:	13.5″	12″
Type:	Mounted air–spaced triplet of high index glass	Mounted air–spaced triplet of high index glass
Coating:	All surfaces anti–reflection (MgFl) hard–coated for maximum picture contrast, light transmission & durability	All surfaces anti–reflection (MgFl) hard–coated for maximum picture contrast, light transmission & durability
Lens Barrel:	Black anodized alum., 5.125″ long x 5.375″ dia.	Black anodized aluminum, 4⅞″ long x 5.375″ dia.
TV Size:	9″ to 17″ diagonal portables, 12″ to 15″ optimum	9″ to 15″ diagonal portables, 12″ to 13″ optimum
Projection:	Any screen size can be used; see chart for sample data	Any screen size can be used; see chart for sample data

It's Versatile

The Edmund Super Projection Lens is an optical system that can meet the precise requirements of many applications . . . from home & club entertainment to industrial projection instruments as detailed above.

It's A Special Lens

Don't confuse this lens with just another projection lens. It's one of the few ever designed for TV screen projection. In fact, the Super Projection Lens was created by an optical engineer who designed the wide-angle display devices used in NASA's space project simulators. It's computer–designed to project maximum TV picture sharpness, contrast, brilliance & accurate TV screen color. Now you can build a complete super screen projection TV system in your home for less than $500. It only cost us about $400 to achieve the same kind of quality found in systems priced at $1,500 and more!

Here's What You Need

The Edmund Super Projection Lens, your own 9″ to 17″ screen (measured diagonally) portable TV set, a high–gain projection screen (available from most photographic dealers), and a few household tools are all you need to build this super system.

What's Involved?

Actually, TV projection systems aren't all that complicated. Simply build a cabinet to fit your decor, place your TV set in the back of it and the Edmund lens in front. Our detailed instruction manual makes the assembly process easy.

We Tried It

Just to prove that it could be done for around $400, we assembled the same kind of system that you will (we used the 13.5″, f/2.6 lens). One recommended method in the manual is to install an inversion switch on your TV since the projection lens inverts the projected picture. With this switch, you can use your TV just as it is. A local TV repair shop quoted us $15 to install the switch. Then we bought a TV projection screen for $110 and we spent $50 in materials to construct a cabinet of ½″ plywood and Formica®. With the cost of the Edmund Super Lens our total outlay was $400!

Order the Edmund Super Projection Lens and get started on your own custom–designed super TV system. Instructions are included with the lens at no extra charge. If you wish, you may order just the instruction manual to find out how easy it really is to enjoy theater–size televison right in your own home.

(A) 12″ f.l., f/2.4 Super Projection Lens **No. 16,014 $250.00**
3 or more 12″ f.l. Super Lenses $225.00 each
13.5″ f.l., f/2.6 Super Projection Lens **No. 16,010 $225.00**
3 or more 13.5″ f.l. Super Lenses 199.50 each
Instruction Manual Only **No. 9565 $1.95**

(B) Precision Lens Focusing Mount

Provides smooth, mechanical focusing for varying lens to screen distances. It eliminates the need to make a rough focusing mount of plywood. Precision–machined for exact fit, it holds the lens at perfect focus. Attaches directly to cabinet with four screws.

No. 72,399 $49.95

Premiums

The Photo Badge & Button Making Machine

Make ID Badges, Political Buttons, Ads, Premiums & Much More!

(A) Now you can make your own permanent, attractive badges for just pennies. It's easy; it's fun; it's profitable. You can personally design any type of badge imaginable. Follow the simple, step-by-step instructions and make a perfect 2¼" diameter badge in just minutes. Great for parties, clubs, schools, fairs, meetings, plant identifications and retail store promotions.

This complete kit has enough material to make 25 badges with fronts, pin backs and plastic discs. Use the circular mirrors and belt buckle to make more imaginative premiums. Also included are a durable hand-cast metal press and dies—sturdy enough to last for thousands of projects. Make instant dollars by selling photo badges at fairs—kids love their own pictures on a photo button! The photo badge & button machine will quickly return your original investment. **No. 72,365 $59.95**

Smaller Kit. Includes plastic press & dies plus enough material to make 12 badges. Great for children's parties! **No. 72,376 $24.95**

Additional Parts

100 Badge Parts	**No. 71,976**	**$15.95**
250 Badge Parts	**No. 72,153**	**35.95**
500 Badge Parts	**No. 72,154**	**64.95**
1,000 Badge Parts	**No. 72,155**	**117.95**

(B) Cut-A-Circle Accessory comes with a spare blade. Cuts clean sharp circles from any printed material or photo. Circle will be exact size needed to produce attractive badges. **No. 42,135 $19.50**

A

ID Badges, Political Badges, Idea & Fun Badges, Name Tags, Premiums. . . Unlimited Uses!

B

BB

C

Rainbow Jewels . . . the Crown Jewel of Premiums!

(C) Looking for a good sales promotion device that's interesting, inexpensive, durable & highly visible? The ever-changing colors of the rainbow gleefully dance on these unique Rainbow Jewels. Your customers & clients will be dazzled by the sparkle & brilliant eye-catching patterns of light & color. Personalize these self-adhesive, shimmering discs and add an interesting dimension to just about anything—business cards, letters, direct-mail promos, name tags—even clothing! A winning gift premium, ad speciality or display item.

Jewel Colors. Please specify color when ordering—silver, copper or pink. If no color is specified, silver will be shipped.

Imprinting. All jewels are printed in black.

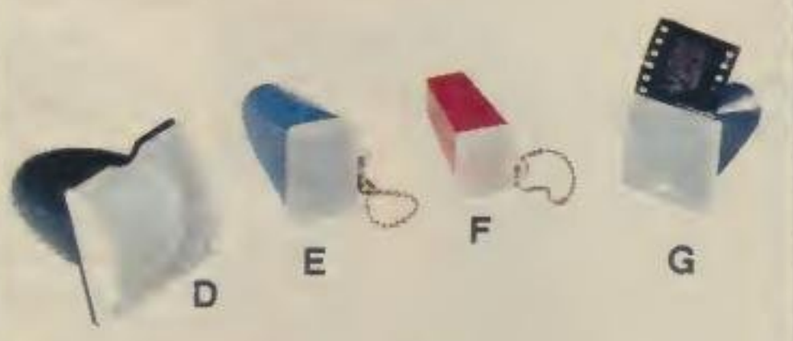
Art Preparation. Send camera-ready art (layout at least 3", no more than 4" in dia.) so we can make a clear, sharp image for your final ⅞" dia. jewels. If you wish our art dept. to design your disc, a one-time only charge of $25 will be added to the $35 plate charge (below) & the quantity price. Of course, we will need a rough idea of what you want. Remember—fewer words make for better & bolder designs.

Plate Charge. There is a one-time only printing plate charge of $35 for your first order. This is in addition to the quantity price. Re-orders of the same design are not subject to this charge.

Delivery. Please allow 3 to 4 weeks for delivery of your personalized order. Plain jewels can be delivered in 2 weeks. All prices are quoted F.O.B. Barrington, New Jersey.

Personalized Jewels	**Plain Jewels**
No. P-19,304 $82.50/M	**No. P-19,303 $49.00/M**

For quantities over 50M, call our National Sales Department about special pricing.



D E F G

Great Premiums, Incentives and Gift Ideas!

Low-Cost Pocket-Size Slide/Film Viewers

Unusual gifts everyone will love! Plastic mini-viewers are also great for premiums. Cut & insert a 35 mm frame or mask & use an 8 mm or 16 mm frame. Show films & slides inexpensively by having a viewer for everyone.

Type	Slide Film Size	Mag. Power	Pkg. Qty.	Number	Price
(D)	35 mm & 2" x 2"	4.7X	6	P-60,876	$ 3.95
(E)	35 mm unmounted	5X	6	P-60,220	3.25
(E)	35 mm unmounted	5X	50	P-70,641	22.50
(E)	35 mm unmounted	5X	100	P-70,642	39.50
(E)	35 mm unmounted	5X	1000	P-70,643	250.00
(F)	8 to 16 mm unmounted	5X	12	P-60, 195	3.95
(F)	8 to 16 mm unmounted	5X	100	P-70,645	22.95
(F)	8 to 16 mm unmounted	5X	2000	P-70,647	349.00
(G)	Film strips up to 35 mm	5X	6	P-60,875	3.95
(G)	Film strips up to 35 mm	5X	100	P-61,146	46.95

The Idea Maker... The Money Maker!

Flag Them Down!

(H) A real eye-catching novelty, the Waving Flag makes an excellent conversation piece for home or office. Heads turn when it's used for store displays. Non-mechanical bi-metal strip means no gears or motors to wear out. Works on principle of thermodynamics. **No. 61,162 $19.95**

Extra bi-metal bands **No. 42,643 2.50**

The Yardarm . . . a sculpture in motion

• An Attractive Desk-Top Gift For The Executive

(I) Made of fine walnut & sparkling brass, the Yardarm is built with the precision of a gyroscope—it bobs up, down & around on a keenly balanced point. You can imprint your logo, message or even a menu on the large plastic sail. Yardarm stands 13" high and the imprintable sail is approximately 6" x 4½". Comes unassembled. **No. 72,349 $12.95**

H I J K

Swing Thing . . . the executive toy

(J) This fascinating toy actually demonstrates the physics of energy & motion! It's as much fun to put together as it is to watch. Perfect as a gift or premium, it's inexpensive enough to be a child's toy, yet handsome enough to be displayed on an executive's desk. Carefully handcrafted in rich, oil-finished wood. Swing Thing has friction-fit parts for easy assembly.

No. 42,634 $5.00

Transparent Domes . . . showcase your collections

(K) Sturdy, clear plastic domes enhance commercial displays as well as household novelties. Great for hanging terrariums! Acrylic.

7" dia. x 3 9/16" deep	**No. 71,710**	**$ 7.95**
12" dia. x 6" deep	**No. 80,179**	**12.95**
12" dia. x 6" deep (no rim)	**No. 80,108**	**17.95**
18" dia. x 8¼" deep	**No. 85,216**	**$24.95 T.C.C.**

20½" x 10" deep (no rim) Shpg. wt. 10 lbs. **No. 85,178 $39.95 T.C.C.**

For special discounts on quantity purchases, call our National Sales Department.

Jumping Discs

Spring Into Action!
With Edmund Jumping Discs

These amazing paper-thin bi-metal discs jump up to 3,000 times their own height! One of the most fascinating scientific curios designed!

CLICK! POP!

They're full of fun & surprises. Simply click a jumping disc between your fingers . . . then lay it down on a smooth surface . . . and POP! It suddenly jumps up to 2½ feet high. Your friends, clients & customers will be amazed . . . and want one of their own.

Simple to use, Jumping Discs work on the principle of thermodynamics. Heat makes metal expand, cold makes it contract. They're made from two layers of dissimilar metals; stainless steel on one side, nickel on the other. Each disc is 1" in diameter & 0.010" thick.

Add interest to your next gathering with Edmund Jumping Discs. Our company name is printed on the label in two colors. Instructions & an explanation of how they work are included in each package, as well as rules for 20 games.

Pkg. of 12	**No. P-41,150**	**$ 2.25**
Pkg. of 100	**No. P-41,180**	**13.95**

HOW ABOUT PUTTING YOUR NAME AT THE CENTER OF ATTENTION!

Now you can imprint your name or insignia on Jumping Discs to make wonderful giveaways. Inexpensive & durable, they can't fail to be handled over & over again by your customers & their friends. Get started with these "popping" good ideas:

1. "Start things jumping with _____!"
2. "You'll flip over _____!"
3. "____ makes sales JUMP!"
4. "Hop to it, buy _____."
5. Your logo

Let your imagination run wild!

A Unique & Inexpensive Premium Idea For Industrial And Business Firms!

PUT A LITTLE "POP" INTO YOUR NEXT PROMOTION with Incredible Jumping Discs from Edmund Scientific

Art Preparation: If possible, send camera-ready artwork with your order. If you can't, our art department can do the art preparation for you. Simply give us a rough idea of what you want including pencil sketch, logo, etc. There is a $25 charge for this service. Remember—fewer words make for bolder & better designs. **Size specifications:** If you submit camera-ready artwork, your layout should be at least 3" & not more than 4" in dia. so we can make a clear, sharp image for the final ⅞" dia. design.

Color Disc Designs:

Please specify the color(s) you wish to use in your design. We cannot guarantee identical colors, but we will match them as closely as possible. Send a color sample if you can.

Quantity Pricing Savings: A $29 first-time order engraving & plate charge must be added to costs shown below.

	One-Color		Two-Color	
Quantity*	**Number**	**Price/M**	**Number**	**Price/M**
1M to 4M	19,161	$96.00	19,162	$98.50
5M to 24M	19,164	90.25	19,165	93.25
25M to 99M	19,167	79.50	19,168	82.00
100M to 499M	19,170	74.00	19,171	75.00
500M to 999M	19,173	68.75	19,174	70.00
1,000M & over	19,176	58.50	19,177	59.50

***Note:** Jumping Discs are sold in multiples of 1,000. All prices are quoted F.O.B. Barrington, New Jersey.

Delivery: Please allow 2 to 3 weeks for delivery of your first Jumping Disc order. Your re-orders can be shipped much faster since we would have your printing plates on file. On very large orders, we can begin partial shipments within 3 weeks.

More Fun With Jumping Discs!

Our customers loved the famous Edmund Jumping Disc so much, we decided to make some that are different and a lot more fun. Offered in two designs—the Susan B. Anthony Disc and the Quarter Disc—they can be used in as many ways as your creativity will allow. Just place one on a table and watch it take off up to 2½ feet in the air! They demonstrate the scientific principle of differential expansion and are great for gaining students' attention in science classes. Each basic package includes half head (one side) discs and half tail (one side) discs. Complete instructions are included. For even more Jumping Disc fun, buy the package of 100!

(A) Susan B. Anthony Jumping Disc Design Based on the Commemorative Dollar Coin!

This unique disc commemorates the pioneer crusader for the women's suffrage movement—Susan B. Anthony—whose work helped to pave the way for the Nineteenth Amendment to the Constitution. Based on the U.S. one-dollar coin, the "tail" side of the disc carries a design of the symbolic eagle of Apollo 11 landing on the moon. Ideal for clubs or as novelty hand-outs.

Pkg. of 20 (10 head & 10 tail discs)
No. P-42,829 $ 3.95

Pkg. of 100 (50 head & 50 tail discs)
No. P-42,830 17.50

(B) Two Bits Go Far With Edmund's Quarter Jumping discs!

Have a bit more fun with a jumping disc that looks like a U.S. quarter-dollar! Just think of the fun you can have leaving tips that blast off or making wagers with money that flies! With your purchase of the basic package, you get an extra bonus—two FREE Edmund Jumping Discs. 14 discs total!

Pkg. of 12 (6 head & 6 tail discs)
No. P-42,099 $ 2.95

Pkg. of 100 (50 head & 50 tail discs)
No. P-42,278 17.50

Customize Your Own Jumping Discs

Send personalized Jumping Discs as unique Christmas cards or sell them at church carnivals & fairs! Typewriter style lettering in black only. Punctuation available! To order, fill in blocks at left with message. Cut coupon & send it w/check or money order **and** our Order Blank.

100 or 200 discs	**No. 29,100**	**$19.00/100**
300 or 400 discs	**No. 29,101**	**16.00/100**
500 & up (lots of 100)	**No. 29,102**	**13.00/100**

Your message may be up to 4 lines of 7, 9, 9 & 7 characters. Spaces count as characters.

Weather

**Stay Abreast Of The Weather . . .
Let Edmund Scientific Fill Your Weather Needs —**

(A) Forecast With Your Own Weather Computer

This professional instrument allows you to predict the weather 24 hours in advance when you use it with a barometer (not included). Predict the weather, wind speed & direction, temperature, cloud conditions & precipitation within a 30 mile radius. Includes a 28 page booklet with a circular plastic slide rule "computer" (programmed to over 5,000 variations of input), coded tables for interpreting data & complete instructions. Effective in all locations north of 25° latitude. Excellent for sportsmen, amateur meteorologists, anyone!

No. 61,061 $8.95

(B) Your Own Daily Weather Log

Each page lets you record temperature, humidity, pressure, wind clouds, etc. for 1 full year. Specially prepared weather resistant log contains explanatory information.

No. 9572 $5.95

What do weather conditions look like above the clouds? See page 90 for **"Meteorology Above The Clouds"** 35 mm slide set.

(C) "Whole Air Weather Guide" by Dr. Walter F. Dabberdt

Weather—everybody talks about it, but this book does more. It tells how & why. Elements are defined & their roles are explored. Provides forecast tips & a broad overview of conditions. 64 pp. Paperbound.

No. 9548 $3.50

(D) "Eric Sloane's Weather Book".

How weather-wise are you? It's always with us & come rain or shine, we have to get along with it! This book is authoritative yet entertaining, scientific while non-technical, factual but completely human in its approach to the explanations of weather's whims. 90 pp.

No. 9553 $3.50

Measure The Rainfall

(E) Digital Rain Gauge

• You Never Have To Empty It!

This battery operated weather wonder saves time & work for homeowners, farmers, students & amateur meteorologists. Measures rainfall in 1/10" calibrations to 99.9". Complete rainfall statistics for the hour, day, week or longer. Don't want to get wet? Take remote readings on the handy indoor counter. Reset button begins new rainfall calculation cycle. Operates for over a year on one 9 V transistor battery (not included).

No. 72,165 $49.95

One/Hundredth Calibrated System. Same features as above but with large collector; measures 1/100" to 99.99". **No. 72,319 $69.95**

Extra Indicator Head. Record rainfall at different time periods, even year to date, while resetting one head after each rain. Use with No. 72,165 or 72,319 above. One gauge can drive up to three heads.

No. 42,559 $29.95

Low-Cost, Easy-to-Read Rain Gauge

Cone-shaped, clear plastic rain collector measures rainfall from 0–1.5" in 1/50" increments. Also measures 1.5–5.5" in 1/20" increments. Includes 2 mounts.

No. 71,439 $6.95

Tune In To The N.O.A.A. Weather Service

The U.S. Government's new radio network broadcasts the official weather news around the clock. 90% of the nation's population is covered by 350 transmitters. Now you can know what's happening before it's too late!

(F) Stormalarm . . . For Safety on Land & Sea

• Alarm Sounds When Conditions Are Dangerous

Tornadoes, hurricanes, severe thunderstorms & marine emergencies are constant threats to life & property. Stormalarm warns you of these conditions the way a smoke alarm warns you of fire. Unlike most weather stations that must be monitored, this one monitors itself. Triggered by a signal from the National Weather Service stations, it sounds a full blast in the event of emergency regardless of how low you've turned the volume. The alarm is followed by a full report. Completely portable, this unit has 3 channels that cover the nation, a 40–50 mile range, continuous beeper & flashing light that function until reset, 2¼" dia. speaker, 25" telescoping antenna, external antenna input, 115V AC to 9 V AC converter & 9V back-up battery. Instr.

No. 72,297 $59.95

(G) Storm Scan Alarm System

• Gives 20 Minute Advance Warning of Danger

Now you can receive advance warning of severe storms & tornadoes. The Storm Scan Alarm aids in protecting against disaster by giving at least 20 minutes advance warning of approaching storms. This is not a weather radio! Instead, it actually senses data directly from local storms by detecting electrical activity up to 30 miles away. Lightning lamp indicates electrical discharge in green flashes. Red "Burst" lamp indicates intense electrical activity. Meter also indicates storm intensity & will trigger audible alarm buzzer when danger nears. Battery operated. **No. 72,456 $89.95**

(H) Forecaster Weather Radio by Weatheralert™

Flip on the Forecaster when you need to know the weather—it's tuned in to the National Weather Service! Though it fits in the palm of your hand, this unit has ten times the pick-up power of ordinary forecasters and a 35–50 mile range. Has crystal-controlled switch-selectable tuning system, 2¼" full-fidelity speaker, 25" telescoping antenna, slide volume control. AC or DC operation. **No. 61,244 $34.95**

Battery operated (only) Forecaster Weather Radio **No. 72,328 $29.95**

Recommended By Edmund!

Announcing . . . The Flight Of Apollo Eleven

A Dramatic Record Album Commemorating The First Lunar Landing. Apollo 11 astronauts Neil A. Armstrong, Michael Collins & Edwin E. Aldrin, Jr., were launched to the Moon by a Saturn V rocket on July 16, 1969. Armstrong & Aldrin landed on the Moon July 20, 1969. They rejoined Collins in the Command Module circling the Moon on July 21, 1969, and successfully returned to Earth on July 24, 1969. The magnificent ebullience of adventure permeated every watching American. Now, on the 10th anniversary of that event, that spirit is recaptured in a musical dramatization of the mission. **No. 72,499 $8.95**

40–Color Slide Sets With Cassettes . . . Our Best

Compiled by Terence Dickinson, Noted Astronomy Author

(Z) Voyagers Encounter Jupiter. Close–up pictures of Jupiter & 5 of its moons highlight this account of the explorations of Voyager I & II spacecraft. **No. P–42,820 $23.95**

(AA) Scanning Planet Earth. These Super Slides contain the most stunningly beautiful views ever obtained of our planet. Minerology, geology, geophysics & agriculture all emerge as fascinating studies w/expert commentary. **No. P–42,831 $29.95**

(BB) Life Beyond Earth. How life is believed to have begun on earth & how it might exist elsewhere. Fascinating! **No. P–42,623 $21.95**

(CC) Other Worlds. Jupiter's wind–swept clouds & Great Red Spot, Mars' rock–strewn surface, the crater wastes of Mercury, more. **No. P–42,622 $21.95**

(DD) Exploring Earth From Space. Photos from Gemini, Skylab, Apollo & Landsat satellites show agriculture, erosion, pollution, more. **No. P–42,621 $21.95**

Save! Buy sets Z, BB, CC, DD for only $79.88. **No. P–42,841 $79.88**

Full Color 35mm Nature & Science Slide Sets (no cassettes incl.)

(EE) Dinosaurs. 2 slides each of Tyrannosaurus, Triceratops, Dimetrodon, Stegosaurus & Plesiosaurus. Ideal for classroom! **No. P–42,405 $7.35**

(FF) Vertebrates. 20 slides by Bucky Reeves include saber-tooth tiger. **No. P–42,700 $10.95**

(GG) Invertebrates. 20 slides by Bucky Reeves include invertebrates of Paleozoic era. **No. P–42,699 $10.95**

(HH) Poison Animals of the U.S. 20 slides by Bucky Reeves. Fascinating! **No. P–42,181 $10.95**

(II) Photomicrography Slides. Excellent for light shows or teaching chemistry. 20 slides & guide. Breathtaking! **No. P–42,530 $10.95**

(JJ) EPA Documents. Shows damage being done to our planet by air & noise pollution, strip mining, solid waste, more. 20 slides. **No. P–42,085 $8.95**

(KK) Central Region of Orion. 2 Spectacular Crab Nebula posters. **No. P–82,064 $7.95**

(LL) Seashore Creatures. Starfish, sea anemones, etc. **No. P–42,354 $10.95**

(MM) Endangered Species. 20 slides by Bucky Reeves. **No. P–42,182 $10.95**

More Beautiful Color Posters & Maps

(NN) Astro Posters. Saturn's rings & the Polar Caps of Mars. **No. P–82,063 $7.95**

(OO) Posters in Blue & White. Orion, Crab & Trifid Nebulae plus Andromeda Galaxy. 20"x28½". Set of 4. **No. P–71,875 $4.95**

(PP) Wall Posters. 22½"x29", set of 6, taken with Palomar telescopes. Fine printing, high quality glossy paper. Frame them! **No. P–82,062 $19.95**

(QQ) Human Anatomy Wall Charts. Set of 14: skeletal, muscular, circulatory, nervous systems & more. 29"x37". Full color. **No. P–70,897 $21.50**

(RR) Apollo 11 & Nebulae Posters. Apollo 11 w/man on moon, Earth from moon & Earthrise. Frame them! **No. P–82,065 $10.95**

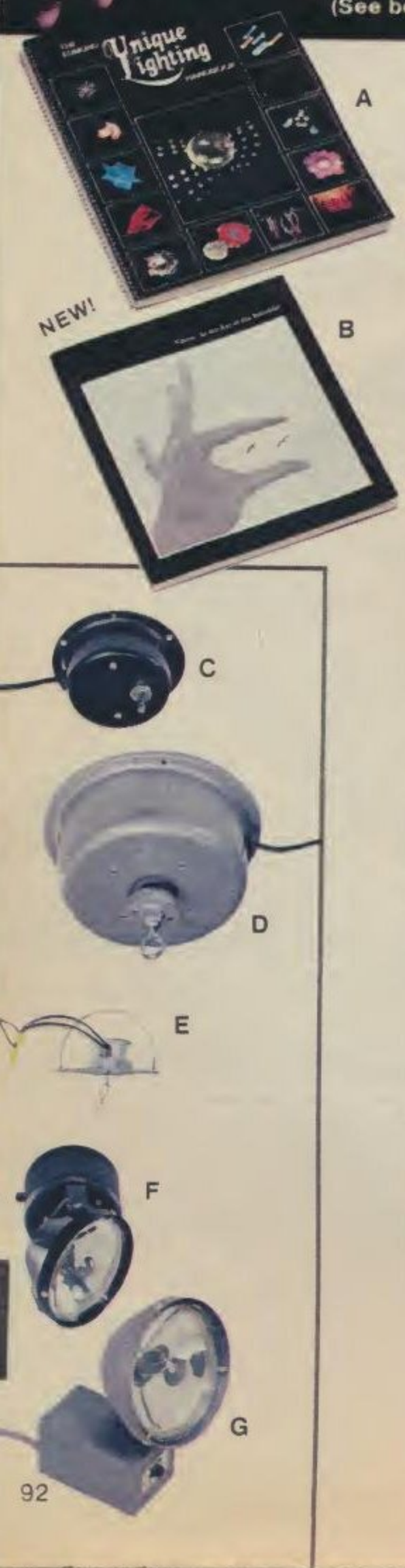
(SS) Science Chart Assortment. Solar System 24"x36", Oceanography 39"x29" (w/ocean floor), Heavens 18"x37" (35 cloud conditions), World Map 50"x38", Physiology Drawings 9"x12", Skeleton Chart 12"x30". **No. P–71,842 $11.95**

Moon Map. Black & white 35"x46" photo-reduced moon w/lunar features marked & named. Educational! **No. 9297 $1.50**

Celestial Map. 5,179 stars: Yale Catalog designations, Bright Star & Flamsteed numbers, 250 star names, more. 6½'x3½'. **No. 83,010 $9.95**

Unique Lighting

See page 94 for complete listing of products used to achieve these effects.



Whether you're setting up a trade display, black lighting a rec room, equipping a disco, putting on a light show or decorating for a dance, we have what you need! Our experience, know–how & huge selection of products provide you with a one–stop source for unique lighting. Just ask our many customers from TV shows, nightclubs & light shows all over the country! Many products in this section are used in the fantastic Light Show Theater in the Edmund Scientific Factory Store. Effects come to life on the 96–foot, wrap–around screen. A great show . . . over 200,000 people have seen it!

(A) The Edmund Unique Lighting Handbook

• Fully illustrated, it's the "how to" manual you need!

A "must" book for anyone interested in unique lighting. It covers virtually every facet of unique lighting & multi–media entertainment from black light to overhead projection. Learn about multi–image programming, lasers, holography, screens & their applications, color organs & color wheels. Develop colored cloud & colliding planet effects. It's all here in this very readable manual.

No. 9100 $9.95

(B) "Vision: In the Eye of the Beholder", by K. C. Cole

• A Collection of & Description of Exhibits on Vision

Look at and into ways we use our eye–brain to make sense of the world around us. Special sections on binocular vision, monocular clues, the perception of patterns & the physiology of the inner eye explore different ways of understanding & experimenting with our sense of sight. To be used alone or with "The Cookbook" on pg. 71.

No. 9582 $5.95

Handmade Mirrored Balls

Perfect for lighting effects in discos, store windows, ballrooms, reception areas, hotels, light shows & parties! These lustrous devices are composed of up to 1,000 glass mirrors! For a truly fascinating effect, add a ceiling motor for motion & play lights on the ball. They create an endless variety of shimmering effects—like a multitude of diamonds. 4" & 6" sizes have ¼" sq. mirrors; 8" to 16" sizes have ½" sq. mirrors; 22" size has 1" sq. mirrors.

Dia.	Number	Approx. Wt.	Price
4"	71,063	12½ oz.	$19.95
6"	71,064	2 lbs.	31.95
8"	71,065	3 lbs. 12 oz.	41.95
12"	71,066	5 lbs. 4 oz.	59.95
16"	85,180	13 lbs.	89.95
22"	85,267	27 lbs.	169.95

Brand New . . . Disco Dynamite. Use this 17" mirrored cylinder for a more avante–garde look! **No. 83,024 $39.95**

The Latest . . . Psychol Pyramid. A 10" mirrored pyramid that looks great by itself or with mirrored balls & cylinders!

No. 72,480 $49.95

Heavy–Duty Ceiling Motors for Edmund Mirrored Balls

(C) 10 lb. Capacity Motor. Rotates loads up to 10 lbs. max. (use motor below for larger loads) at a steady 4 rpm. Uses 115 V AC. Has 4" dia. black metal case w/mounting flange & 3 screw holes. Overall motor height: 2 9/16". Drive shaft has hole to attach wire for mirrored balls, displays, mobiles, etc. **No. 60,744 $26.95**

(D) 40 lb. Capacity Motor. For our large mirrored ball, it rotates clockwise at 2 rpm. Uses 115 V AC. Overall height: 5¾". Has ring on drive shaft. Shpg. Wt. 4 lbs. **No. 72,279 $49.95**

(E) Low–Priced 4 rpm Motor. Can be used with most of our mirrored balls. Smooth, quiet operation on 115 V AC. 2½"x2", 1¼" face plate, ½" shaft tip with 1/16" hole for S-hook (incl.), wire hanger. Approx. 5 lb. capacity. **No. 60,825 $17.95**

(F) Pin Spot Lamp . . . For Permanent Installation

Can be shelf–mounted or installed directly into electrical outlet box. Mounting hardware included. Excellent for lighting mirrored balls & other visual effects. Projects a very long, narrow beam of light. Yoke–mounted lamp element rotates 360°. 115 V AC. On/off switch & GE #4515 6V bulb included.

No. 72,329 $47.95

Pin Spot Color Filters. Filter sandwiched between 2 metal retainers. Hardware included. **Each is $8.95.**
Blue: No. 42,703; Amber: No. 42,704; Red: No. 42,702
Sealed Beam Replacement Lamp. Fits No. 71,010 & No. 72,329.
No. 42,737 $8.95

(G) AC Portable Spotlight. Plugs into any outlet. Excellent for discos & use w/mirrored balls. Provides a bright, narrow beam of light (60,000 beam candle power). Head rotates approx. 170°. 4⅞"x4½"x4⅜" folded. GE #4515 6V bulb & 115V AC line cord included. **No. 71,010 $46.95**

Strobe Lights Stop The Action

(H) The Party Light Strobe. Adjustable; utilizes 50 W/sec. Xenon flash tube; produces over one million flashes. Circular reflector intensifies flash. 115 V AC operation. **No. 72,178 $29.95**
Flashtube replacement. No. 41,248 8.95

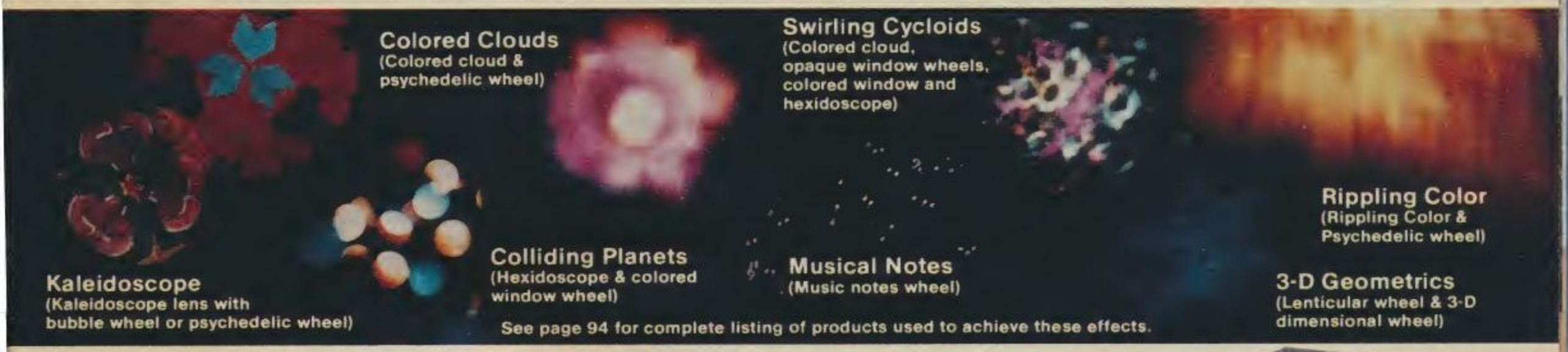
(I) The Blue Box. Wire–in bulb assembly gives 3–5 million flashes. Externally replaceable fuse. 115 V AC operation.

No. 71,703 $179.95
Flashtube Replacement. No. 41,814 34.95

(J) The Big Bopper. Utilizes 200 W/sec. Xenon flashtube. 3–5 million flashes. Remote control & single flash capability. Mounting bracket, rubber feet, 6½" reflector. See pg. 50B for warranty info. Wt. 9¼ lb. **No. 71,346 $295.00**
Flashtube Replacement. No. 41,158 29.95

(K) Super Strobe. Perfect for heavy–duty & professional use. Solid state circuitry; 7¾" long–life Xenon flashtube w/wide area illumination (60'x90') for over 5 million flashes, fan–cooled motor w/switch, 10"x5" curved reflector, remote control w/flash rate control (50 w/sec. flash max. at 1–12 flashes/sec.). Uses 115 V AC, max. input 600 w. See pg. 50B for warranty info. Wt. 10 lb.

No. 1604 $425.00
Flashtube replacement. No. 61,060 39.50



See page 94 for complete listing of products used to achieve these effects.

150 Watt Dichroic Spotlights. Full, rich color w/cooler lamp operation for color organs. No distracting rim brightness. Internal filter coatings are chip, scratch & peel proof.

Each $15.95 **Yellow: No. 71,051**
Red: No. 71,048 **Blue: No. 71,050** **Green: No. 71,049**

(A) Completely Assembled 40 Foot Chaser Lights. Great for displays, in-store promotions & fashion shows. Electromagnetically driven timer, 46' of 3 circuit flexible cord, 120 candelabra sockets, 120 frosted 1½" non-glare, 10 W cosmetic bulbs. Operates on 115 V AC. U.L. listed. **No. P-80,278 $189.50**
40 ft. set without timer. **No. P-80,279 125.00**

Chaser Light Mounting Strips. Snap easily into 30" channel selections; mount w/double-backed adhesive tape.
Pkg. of 16 **No. P-61,187 $44.95**
Placement bulbs. (pkg. of 12) **No. P-42,666 12.95**

Color Organs Let You Experience Music With Your Eyes!
Color organs are electronic devices which control groups of colored lamps whose flashes are triggered by music. The lamps are made to blink & vary in brightness in relation to the music's rhythm, volume & pitch. Great for audio light shows!

(B) The Edmund 3-Channel Sound To Light Control. Completely pre-wired, this unit lets you modulate 3 independent lamp circuits. Plug into a colored flood or spotlight. 100 W/channel peak rating. Metal housing. **No. 42,309 $24.95**

(C) 4-Channel Color Organ. 4 frequency sensitive channels w/controls for low, mid-low, mid-high & high ranges. 425 W/channel, 115 V AC, 15 amp. Use 60 amp service to increase to 1500 W/channel (6,000 W total). **No. 72,243 $650.00**

(D) Powerful 6,000 Watt light Chaser/Color Organ. 4 individually controlled, frequency selective channels: **Light Organ Mode**—4 ranges/channel, microphone & 3 aux. inputs, master gain control, controls for micro. & aux. inputs and input level compensator. **Light Chaser Mode**—four 1500 W channels, 5 function select, color select, direction select & rate control. 117 V AC, 60 Hz, 12 A.
No. 80,274 $940.00

(E) New! 3-Channel Color Organ. Features sequential lighting control system. Lights can be set to chase from one channel to next at constant speed. Adjustable speed from slow to fast strobe-like effect. Lights can be set to chase each other to music. 117 V AC, 600 W/channel, will operate incandescent & inductive loads.
No. 72,494 $325.00

(F) 3-Channel Sequential Flasher. Produce effects like racing chase lights on movie marquees. Solid state, it operates in variable rate, free-run or audio-synchronized mode. Strobe rate control can vary sequencing from 1 change/2 sec. to 15 changes/sec. Built-in audio sensitivity control, channel monitoring lamps & audio input phone jack. Input power: 115 V AC, 60 Hz. Output: 500 W max./channel. Audio input: 250 mV/min. **No. 71,430 $119.95**

(G) Professional Disco Effects from Roctronics

Professional 6-Channel Dimmer Control. Ideal for stage, disco & touring performers. 1 lb. solid-state unit gives 6 circuits of smooth, linear dimming control. A Glide Keyboard® permits sequential triggering of lights. Variable chasing speeds for max. flexibility & fade features. Split mode permits chase & dimming at same time. Connect controller to 1 or 2 Dimmer Packs (below) with available cables for total lighting control. **No. 17,001 $495.00**

3 X 750 Watt Dimmer Pack. 3 solid-state dimmers; plugs into any 115 V AC, 20 A, grounded outlet. Remote input & slave connectors for unlimited system expansion, fast-acting fuses, recessed controls.
No. 16,004 $395.00

3 X 3000 Watt Dimmer Pack. 3 dimmers, blackout switch, 18 grounded outlets, remote control input, remote slave output which allows unlimited system expansion, detachable power input, recessed controls. Requires 115 V AC, 75 A power source. **No. 16,003 $525.00**
50 ft. Control Cable **No. 61,158 39.95**
100 ft. Control Cable **No. 61,159 64.95**

3 X 600 Watt Portable Power Panel. A rugged, reliable, direct-wired control system that can be used anywhere to obtain basic control functions of dimming, keying & switching. 3 rotary dimmers w/preset switches, 3 keys & 4 on/off switched outlets. 115 V AC, 20 A operation. **No. 61,157 $290.00**

Color Wheels and Parts: Plastic wheels w/transparent colors in pie-shaped wedges of yellow, blue, lavender, red, green & purple have ¼" center hole.

Wheel Dia.	Wheel Only	Price	Complete motorized Unit: Wheel, stand, 12 rpm motor	
6"	No. 71,115	$ 9.95	No. 71,006	$27.95
9"	No. 71,116	10.95	No. 71,007	29.95
12¾"	No. 71,117	11.95	No. 71,008	32.95

9" Diameter Disc. make your own wheels for color, polarizing, kaleidoscopic & special image projection. ¼" center hole.
Plastic (pkg. of 2) **No. P-70,996 $14.95**
Glass (pkg. of 2) **No. P-71,087 8.95**

Transparent Paints For Slides & Lamps. Paint ordinary light bulbs! Ideal for flow painting. 12 (2 oz.) bottles & thinner. Create your own light show effects! **No. 71,067 $24.95**

Transparent Paint That Crystallizes! Dab it on. As it dries, "splintered" crystal patterns spread in all directions. 12 (2 oz.) bottles in assorted colors. **No. P-72,008 $19.95**

Polarized Slide Sets. Make your light show come alive with slides that have motion. Slides require a polarizing spinner in front of projection lens.

Polarized Color Sets . . . Kaleidoscopic Patterns			
Set A	12 slides	**No. P-41,170**	**$ 7.95**
Set B	12 slides	**No. P-41,178**	**7.95**
Set C	12 slides	**No. P-41,179**	**7.95**
Polarized Psychedelic Sets . . . Geometric Patterns			
Set A	12 slides	**No. P-41,169**	**$14.95**
Set B	12 slides	**No. P-41,175**	**14.95**
Set C	12 slides	**No. P-41,176**	**14.95**
Set D	12 slides	**No. P-41,177**	**14.95**

Polarizing Spinner Kit with 30 rpm motor & 6" disc or polarizing material. Instructions included. **No. 71,132 $23.95**

Easy-To-Cut Transparent Color Filters—see page 25.

CBS Sound Effects Library—Over 90 Separate Effects:
This three-record set is an indispensible creative production tool for radio, disco, TV and audio/visual directors. Every sound is recorded "live"; nothing artificially produced. Locked grooves prevent stylus from unwanted advance. Zero db reference gives precise control. Descriptions Incl. **No. P-72,455 $14.98**

Automatic Repeating Cassette. Records & plays back on most stereo & mono cassette recorders that have capstan drive. Amazing sound quality due to exclusive microcron lubricated tape. Records for 20 minutes. **No. 60,920 $12.95**

Surplus! Memorex LD-3 12" Magnetic Tape Reel. Hundreds of uses besides storing tapes!
No. 72,458 $ 2.95
Pkg. of 5 **12.95**

B

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D

NEW!

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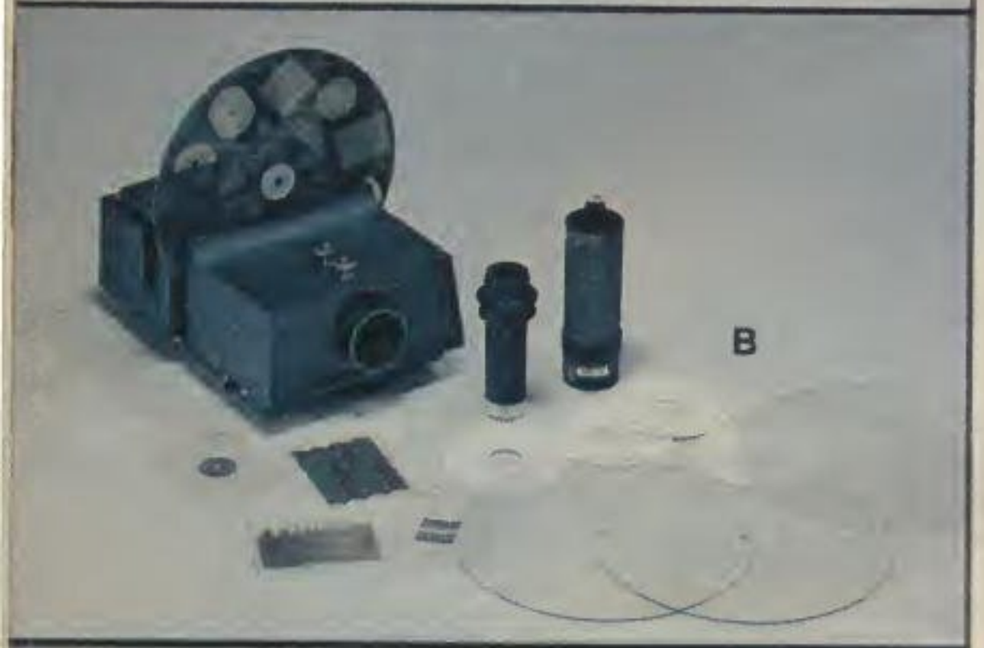
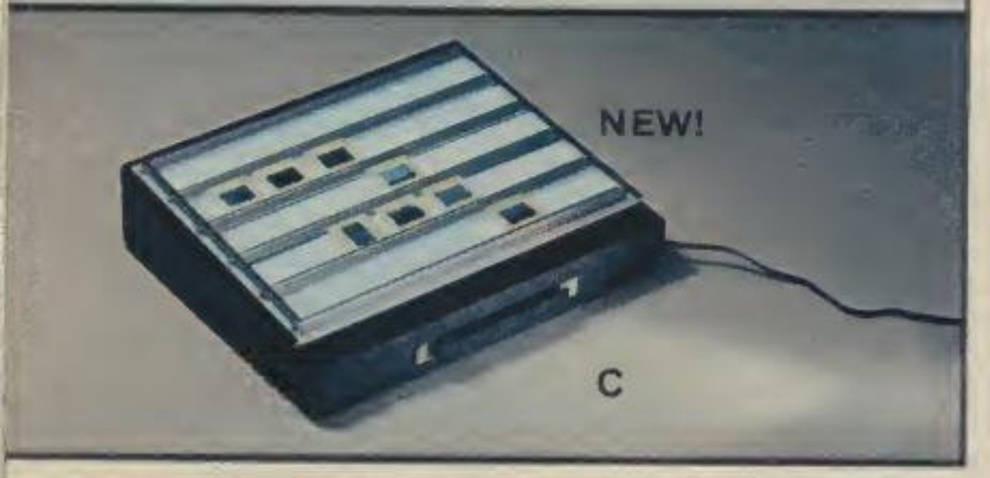




Black Light Fixtures

Giant 4 Foot Long Black Light. For areas of 15' or more. 115 V, 60 Hz., strip metal fixture (1¾"x2¾"x4'). 40 W BLB lamp incl. Rapid start ballast.
No. 83,012 $49.95

Mirrored Reflector makes 8 W bulb shine like 40 W! With 8 W black light bulb, provides 5M hours of long wave (3660 A) black light. 115 V, 60 Hz, U.L. listed cords. Shockproof endcaps. **No. 71,274 $29.95**
Replacement Bulb **No. 60,899 9.50**

Black Light Filter–Type Bulbs—Long Wave

Number	Wattage Tube	Length	Price
60,899	8	12"	$ 9.50
60,126	15	18"	7.95
83,006	40	48"	29.95

Non–Filter Type Black Light Bulb. Transmits visible & long wave UV light. 6W, 9" long. **No. 60,565 $2.60**

Black Light Accessories

Ultraviolet Pen. Fiber point pen to use as invisible security for paper items. Writing glows under black light. Pkg. of 3. **No. P-61,082 $7.25**
Black Light Chalk. Use w/ordinary or black light. 6 pieces, assorted colors. **No. P-41,063 $9.95**
Black Light Crayons. Pkg. of 24.
No. P-42,196 $2.95
Invisible Ink for rubber stamp use. Invisible under ordinary light. 1 pt. **No. 60,665 $12.95**
Special Stamp Pad. **No. 41,084 2.95**
Fluorescent Body Paint. Non–toxic water colors. Six ¾ oz. jars: green, red, blue, orange, yellow, pink.
No. 42,596 $2.95

Apparatus For Use With Visual Effects Projector Sets

Lenticular Wheel. 9" dia., plastic, used w/12 rpm motor. Spinning in front of projection lens w/another special effect wheel in gate creates wild, whirling 3–D effects. **No. 71,252 $9.95**
Striped Wheel. 12 stripes, 6 colors. Glass, 9" dia. Provides moving colors. **No. 71,256 $9.95**
Shooting Star Wheel. Glass, 9" dia.
No. 72,450 12.95
Star Wheel. Glass, 9" dia. **No. 72,449 12.95**
Snowflake Wheel. Glass, 9" dia. **No. 72,448 12.95**
Colored Window Wheel. **No. 71,211 12.95**
Window Wheel. Same as above but windows are clear. Paint or attach slides on them.
No. 71,242 $7.95
Musical Note Wheel. Glass, 9" dia.
No. 71,097 $12.95
Bubble Wheel. Liquid–filled bubbles ooze & cascade.
No. 71,393 $39.95
3–D Wheel. Use w/71,252. **No. 72,197 $12.95**
Psychedelic Wheel. Use w/any accessory for unusual effects. Glass, 9" dia. **No. 71,122 $14.95**
Make Accessory Polarized Color Wheels. Everything you need. **No. 71,100 $14.95**
9" Polarizing Spinner Disc. **No. 71,099 24.95**
Adjustable Diaphragm. Fits V.E.P. for conversion to low–cost spotlight. 3"x5"x1". **No. 41,210 $24.95**
Rippling Color Accessory. Multi–faceted 2½" glass ball, 12 rpm motor & bracket. Use w/V.E.P.
No. 71,210 $34.95
Universal Mounting Bracket. Mounts V.E.P. from ceiling, on stand for table use, from theatrical pipe clamp on stage lighting rail, more. **No. 60,772 $19.95**
Base for above bracket. 12" dia., steel. Necessary hardware included. **No. 71,235 $11.95**
Low–Cost, Long Throw Projection Lenses. Match the f.l. to your lens–to–screen distance.
5" f.l. f/3.5 for 20–25 ft. **No. 60.802 $29.95**
6" f.l., f/4.0 for 25–30 ft. **No. 60,801 24.95**
7" f.l., f/4.5 for 30–40 ft. **No. 60,800 24.95**
8" f.l., f/5.3 for 40–50 ft. **No. 60,799 29.95**
Motors. Hubs on shafts steady wheels w/¼" center holes. Wing nut, 6' cord & plug. CCW rotation.

RPM	Number	Price	RPM	Number	Price
½	60,791	$16.95	12	60,714	$14.95
1	60,734	12.95	30	60,763	16.95
4	42,293	12.95	60	60,733	16.95

Stand. Holds above wheels & motors. 8" high.
No. 71,118 $5.95

New! Projector Level. Lines up 2x2 slide projectors. Great for aligning superimposed images or rechecking equipment position after lamp changing or moving projector. Includes bubble leveler to adjust horizontal plane, circular & vertical indicators for positioning when superimposing, storage box, tool for leveling. Fits 80–position circular slide trays. Pkg. of 2.
No. 42,611 $7.90

(A) Complete Visual Effects Projection Kits

Everything you need to create psychedelic spheres, wispy colored clouds, colliding planets & much more! Add accessories & special effects as you need them. Kit available w/standard Visual Effects Projector (No. 71,057) OR w/professional Visual Effects Projector (No. 71,248). Each kit includes: 3–way Kaleidoscope Lens, Hexidoscope, Psychedelic Wheel, Colored Window Wheel, Colored Cloud Accessory, 1 rpm motor, Brackets for Wheels.
Standard Kit **No. 71,295 $149.95**
Professional Kit **No. 71,868 179.95**

Projectors

Edmund Visual Effects Projector. Bargain priced unit to use for light shows, spotlight, 35 mm projector & with all products on this page & page 93. Includes 2 built–in bolts to mount special effects wheels, 3 projector apertures to regulate beam, 500 W lamp, thermostat, fan, 3" f.l., f/3.5 anastigmat lens, wide slide gate for special wheels & disc for twelve 2"x2" slides. **No. 71,057 $89.95**
Remote Control Slide Changer Projector.
No. 71,002 $79.95
Professional Model. Remote control switch for lamp. 2 AC accessory outlets. **No. 71,248 $99.95**
Extra Lamp. 120 V, 500 W DAK **No. 41,154 7.95**
400 W CYK Lamp. 30% dimmer, 80% longer life than above. **No. 41,544 $14.50**

Accessories

12 Slide Discs. **No. P-70,992 $ 4.95**
3–Way Kaleidoscope Lens. **No. 60,818 26.95**
Hexidoscope (semi–kaleid.) **No. 60,797 19.95**
Colored Clouds. **No. 71,208 19.95**
1 rpm Motor w/adapter. **No. 60,734 12.95**
Brackets. Support motor–driven wheels in slide gate & in front of proj. lens. Set of 2. **No. P-60,748 $4.95**

(B) 2–Wheel Visual Effects Projector

Create a multitude of unusual effects including moiré! 2–motor rim drive system accepts 9" & 4½" glass or plastic discs; combine both sizes for truly unique images. Comes with 3–way Kaleidoscope Lens, Hexidoscope, Lenticular Wheel, 2 blank 9" glass wheels, 6 blank 4½" cardboard discs, moiré wheel and instructions. **No. 72,071 $169.95**
Replacement Lamp **No. 41,154 7.95**
(12) 35 mm Slide Discs **No. P-70,992 4.95**
9" Moire Wheel Only **No. 72,072 13.95**

(C) Portable Lightweight Viewing System

The Acculight™ System for viewing transparencies, slides & X–rays is recommended for professionals in graphic arts, business, medicine and education. It's portable; just carry it with you as you would an attaché case. With an ANSI standard 5000° K light source & a CRI rating of 91±, this system meets the strictest color rendition of any professional. Mount it on a wall or flat on a table. Includes a 15 W lamp (9000 hr. life) & vinyl carrying case. **No. 80,294 $76.95**
Acculight™ Portable Overlay. Sturdy aluminum frame has 40 slide capacity. Foam insert in bottom channels keeps slides in place. Excellent for viewing & storage!
No. 72,460 $16.95
Replacement Lamp. **No. 83,021 9.95**

(D) Completely Portable Light Show

Everything you need for a professional light show! Includes Lighting Control Console for remote control, Carousel Projector, 3 Visual Effects Projectors, 12" mirrored ball, ceiling motor, spotlight, motorized color wheel, large variety of special effects wheels, 3 motors, 3 bracket sets, transparent paints, polarized slides & spinner, strobe (No. 71,703), 14 power cables, two projection cables, instructions and much more! Shp. Wt. 175 lbs. **No. 85,210 $1495.00 T.C.C.**

Weather

Thermometers
If you're tired of annually replacing outdoor thermometer bargains that crack & fade, of inaccurate readings you can't trust, or of hard-to-read dials, then try one of our thermometers.

(A) Decorative All–In–One Weather–Station For Your Home!
Now you can observe the atmospheric conditions of your own living space . . . and experience old world charm with this beautiful weather station in wood grain frame. You can obtain temperature readings on the thermometer, atmospheric pressure readings on the barometer and humidity readings on the hygrometer. It will add a touch of elegance to any room. Simulated brass finish. Adjustable for vertical or horizontal hanging, it measures 5¾" x 15½". Etched aluminum dials rotate 90°. **No. 71,833 $29.95**

(B) 2 Foot Indoor Fahrenheit/Celsius Thermometer
A valuable teaching aid and ready metric reference in weather studies, this high quality, extremely durable wall thermometer is 24" high and is mounted on white enameled wood. It has large, easy to read scales for both Fahrenheit and Centigrade readings. Conversion tables are printed right on the scale.
No. 72,222 $19.95

(C) Digital Indoor/Outdoor Thermometer
This solid state, electronic device uses a thermistor that senses the temperature and sends an electronic signal to a micro-processor (a computer on a chip). This information is converted to the easy-to-read, bright digital display on the front of the thermometer. At the flip of a switch you can read the room temperature or the temperature outside in either Fahrenheit or Celsius. The electronic digital thermometer installs easily, uses a 9 V battery (not incl.) and has two temperature sensors. Outside sensor can be installed through a window without drilling holes. Temp. range: –31° to 122°F.; –35° to 50°C. Dimensions: 4½" high, 1¼" deep. Weight: 7 oz. Low battery indicator. Perfect for home, office, industry, or anywhere temperature changes should be watched. **No. 61,176 $49.95**

New! . . . Unique! . . . Innovative!!!
(D) Digital Time And Temperature Indicator
Computemp II is a totally new, unique innovation in time and temperature instrumentation. This state-of-the-art marvel is more than a digital alarm clock, it's an electronic digital temperature indicator and alarm. It has a temperature memory that recalls the day's highs and lows in Fahrenheit and Celsius—at the exact time they occured. The temperature alarm goes off to alert you when the temperature reaches the temperature settings you've pre-selected. Computemp II has an extra sharp LED display with exciting alternating display action. It is extremely attractive and handsome, yet durable and rugged because of the unique blend of aluminum, plexiglass, and formica. Size: 6½ x 2¾ x 4½". Standard outside probe wire length: 40'. A full 1 year limited warranty. Computemp II: the perfect gift for anyone.
No. 61,236 $89.95

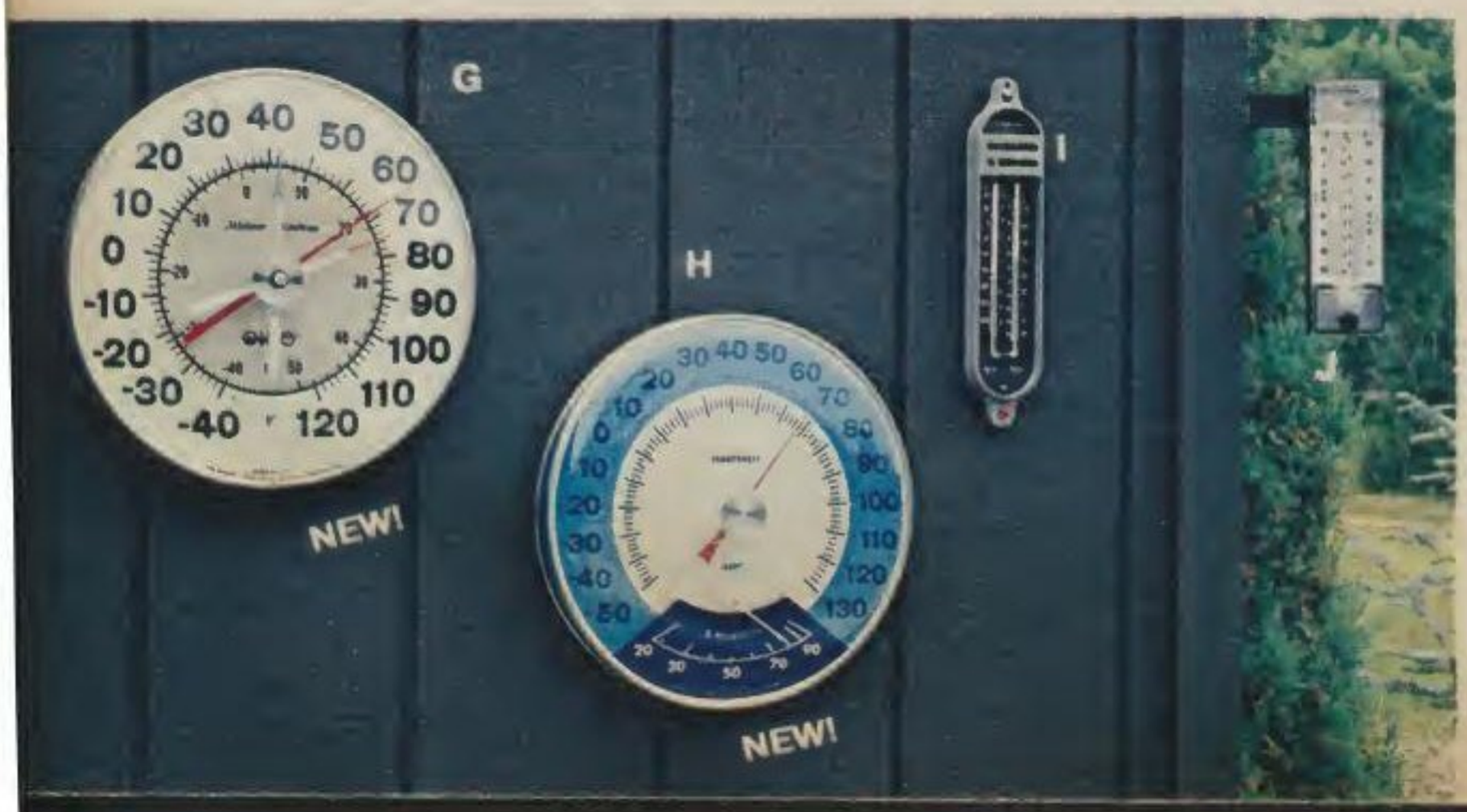
(E) 1" Dial Thermometer
Quality and convenience in an accurate mini dial thermometer. It has a 1" dial and 5" by 0.150" dia. stainless steel stem with pointed tip and pocket case. Silicone damped, lucite crystal. Accurate to within ½°.
No. 42,764 $14.95

(F) An Electronic Thermometer
Three inputs measure temperatures at three separate locations up to 1000' from instrument. Four position push-button selections: dual temperature scales (–22° to 122°F & –30° to 50°C). Accuracy: ±1°. Three solid-state waterproof probes with 15' cables. Uses one "D" batt. (not incl.). Walnut cabinet.
No. 71,741 $87.00

Extra 15' probe **No. 41,839 $9.95** 50' ext. cord with connectors **No. 41,838 9.95**

(G) New!!! The Min-Max Thermometer
You can tell the lowest reading, the highest reading and the present temperature reading, all at a glance, with the new jumbo, easy-to-read Min-Max Thermometer. It's a full 12" diameter dial thermometer with three separate, colorful pointers for each temperature reading. Pointers can easily be reset by a simple turn of the re-set knob. Steel and aluminum construction with convex plastic crystal. Large, bold numerals for easy-reading.
No. 72,467 $16.95

(H) 12" Dial Temp–Humidity Thermometer
This jumbo size thermometer, with bold easy to read numerals, gives you the relative humidity and the temperature at just a glance. With a permanent hanger attached to a metal frame, this durable thermometer can be used indoors or out.
No. 72,468 $11.95



(I) Home & Industrial Outdoor Thermometer
Self-registering unit shows maximum and minimum temperatures in 2° increments from –40° to 120°F. Check automatic temperature setting equipment or study atmospheric temperature variations. Includes plastic case, screw slots for hanging & mounting screws, resettable magnet & instructions. 2½"x10½".
No. 71,478 $19.50

(J) Versatile Day & Night Outdoor Thermometer
The "thermometer that remembers" gives present temperature & tells you in both Fahrenheit & Celsius how hot or cold it was since you checked last. It offers an instant weather report so you'll know when to protect plants, add anti-freeze or fire up the furnace. High impact polystyrene case. Range: –30°F to 120°F; –30°C to 50°C. Adjustable bracket. **No. 42,557 $24.95**

Recording Thermometer (Not shown)
A sensitive instrument for meteorologists & experimenters. Magnified pointer motion gives instant response to temp. var.—40° to ±120°F. Incl. 13 weekly charts, ink & instructions. Similar to Recording Barometer on pg. 96. **No. 70,312 $179.95**
52 Extra Charts **No. P-90,045 9.95**

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NEW!

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Weather Instrumentation

(A) Lufft Outdoor Window Weather Station. This complete miniature weather station will give you up–to–the–minute weather data where it counts . . . right outside your window. Features barometer, Fahrenheit/Celsius thermometer & hygrometer to give you air pressure, temperature and relative humidity. Calibrated in 1/1000 inch of mercury the barometer indicates pressure from 27.58″ to 31.02″. Thermometer is calibrated from –12°F (–24°C) to +126°F (+54°C) in 2°F and 1°C increments. Hygrometer is calibrated in 1% increments of relative humidity from 0 to 100%. Attractive antique white metal case (7″x2½″x1¼″) mounts directly to window frame on moveable arms. Weatherproof. **No. 61,151 $114.95**

(B) The Seasprite II Barometer. A high precision barometer with a handsome, yet rugged, weatherproof black wrinkle finish metal case for the nautical look. Black dial with white numerals and hands. Temperature compensated movement. Hands measure changes in both centimeters and inches of mercury. 6¼″ diameter; 3″ depth; 4″ dial. Fit for an Admiral . . . or your office or den. **No. 61,239 $59.95**

(C) Quartz Movement Accuracy. The Quartzmatic Seasprite II, matching companion to the Seasprite II Barometer, is a handsome bulkhead clock with chronometer–precise quartz crystal movement. Its black 24 hour dial, white numerals & hands are framed by the weatherproof black wrinkle finish metal case for a sharp nautical look. Operates for a year on one C–size battery. Diameter 6¼″, depth 3″, 4″ dial. **No. 61,238 $67.95**

Lufft . . . Our Highest Quality Weather Instruments

(D) Bi–Metallic Indoor Dial Thermometer. This highly accurate bi–metallic dial thermometer is perfect for customized home weather stations. Housed in striking satin black aluminum case with chrome bezel ring, it responds instantly to changes in temperature. 5″ diameter, white baked enamel dial with black Fahrenheit and red Celsius scales. Fahrenheit scales range from –30° to 130° in 5° divisions. Celsius scale ranges from –35° to 55° in 2° divisions. A professional instrument for the home, office, or laboratory. **No. 61,135 $49.95**

(E) Highly Sensitive Hygrometer. Certified accuracy within ±3% RH under the Federal Republic Test Society standards. More reliable than hair or spring type mechanisms. Calibrated to ±2% RH in temperatures to 230°F. Relative humidity scale: 0% to 100% in 2% divisions. Black aluminum case & chrome bezel ring are designed to withstand heat. Includes test certificate. Mounts to wall or instrument panel with 3 screws (included). **No. 61,136 $69.95**

(F) Hygrometer/Thermometer Shows Humidity & Temperature. This dual instrument has a professional–looking black aluminum case & chrome bezel. The hygrometer is certified ±3% accurate in temp. ranges –32° to +230°F. Relative humidity scales: 0–100%; Temperature readings—Fahrenheit: +10° to +170° in 5° divisions: Celsius: –8° to +75° in 2° divisions. 5″ diameter baked enamel white dial. (6″ diameter overall). **No. 61,137 $79.95**

(G) Classic Barometer . . . Industrial Quality. A polished brass classic, this beautiful wall barometer boasts Lufft's famous barometric movement. Its watchlike copper and brass craftsmanship is easily viewed through a sparkling convex crystal cover. 5″ diameter polished metal dial has traditional black & red weather designations. Scaled from 27.5″ to 31.5″ of mercury in decimal divisions. An excellent gift for the home or office, this rugged, decorative barometer may be mounted on a wall or wooden plaque. **No. 61,138 $99.95**

(H) Sensitive Desk Barometer. An accurate barometer that is just right for school, laboratory, or home weather station. It's the perfect gift. The dial is calibrated in inches, centimeters, and millibars of mercury. Gilded case has a 4″ silver dial with black numerals and gold set hand. **No. 41,951 $13.95**

(I) Altimeter/Barometer. This high quality desk instrument is handsomely cased in polished aluminum & durable black plastic. As a sensitive precision altimete. .t effectively reads altitudes from sea level to 12,000 ft. in 100 ft. increments. Reads barometric pressure from 960 to 1080 mbar in 20 mbar increments. **No. 42,768 $79.95**

(J) The New Desk–Top Comfort Meter. Combines a "Durotherm" hygrometer & bi–metallic thermometer to show the relationship between humidity & temperature. The white enamel dial is marked to show the comfort range. Intersection of pointers in the "Comfort" zone indicates ideal atmospheric conditions. Hygrometer ranges from 20–100% relative humidity in 2% divisions. Temp: 36–102°F in 2° divisions; 2°–40°C in 1° divisions. 3½″ diameter base of highly polished brass. Hang it on the wall or let it stand by itself. **No. 42,767 $42.95**

Hygrometers

(K) Hygrometer "Discomfort Meter" Records Relative Humidity. A wet & dry bulb–type instrument that's the standard for relative humidity. Gives both room temperature & moisture content of air (scale from 0 to 120°F). 2 easy–to–read thermometer tubes & hinged chart allow computation of humidity. 4″x10″ plastic case with a water reservoir. Designed for wall mounting. Includes instructions. **No. 71,975 $10.95**

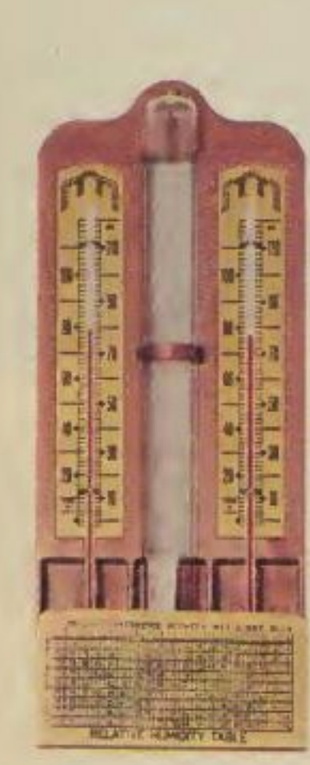
(L) Sling Psychrometer for Home or Laboratory. A classic instrument. Contains wet and dry bulbs in a convenient "Sling" package for the precise determination of the relative humidity. 9″ tubes recessed in gray metal back. Folding swivel tables, wicks and instructions included. **No. 71,477 $34.95**

(M) Taylor Hygrometer . . . Attractive, Streamline. This good–looking instrument uses the most accurate sling psychrometer principle of wet/dry bulb measurements. Has a ring top & plastic handle for convenient attachment of cord. Unit comes complete with wicks & slide rule–type circular scale which allows you to read the humidity quickly and easily. 6¼″ x 1½″. **No. 42,548 $5.95**

Barometers

(N) Precision Recording Barometer. A sensitive, precision instrument for the professional meteorologist, serious amateur & experimenter. Combines a universal altitude range & magnified pointer motion for instant response to pressure changes. Responds with practically no observable lag when pen motion changes. With a range of 29″ to 31″ of mercury, it provides a permanent weekly record of pressure changes. Effectively operates at any altitude from sea level to 10,000 ft. Easy–to–read, 3¾″ high chart drum runs on 115 V AC, 60 Hz clock drive & is mounted on rugged black plastic base under a removable clear plastic cover. Incl.: 52 color–banded weekly recording charts; red chart ink; instructions. **No. 70,600 $145.00**
52 Extra Charts. No. P-90,044 9.95

(O) The Teaching Barometer. Air can be squeezed in or evacuated to simulate changes in atmospheric pressure. It reads in three scales: millibars, millimeters, and inches of mercury. Handsomely styled in silver & black with sparkling chrome trim, this barometer is ideal for teachers & experimenters. **No. 61,113 $29.95**



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Recommended By Edmund!

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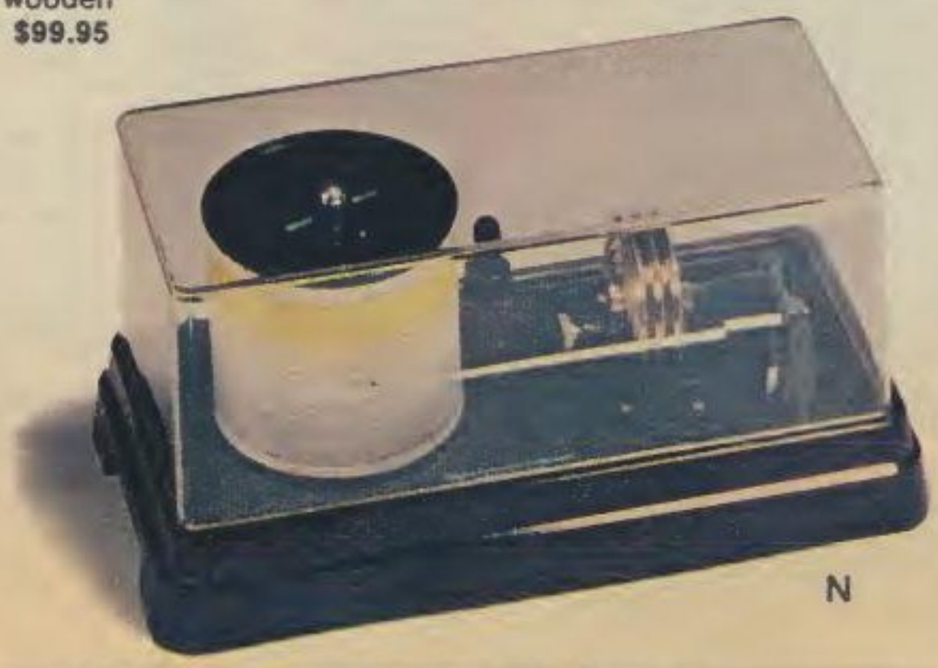

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Weather

Wind Speed And Direction Indicators

(A) Professional Monitor For Home & Work

• 2 Wind Velocity Scales For Accuracy
• Battery Operated • Corrosion Resistant

Perfect for wind monitoring at home, office, farm, marina & airport, this precision unit mounts on roof, flagpole, barn or antenna. Just use standard TV antenna mounting hardware. Easy-to-read indicator gives both wind speed & direction on one dial. 2 speed ranges: 0–25 mph & 0–100 mph. Only 6⅜ x 5⅛", the indicator's attractive mahogany finish mounts indoors & blends with any decor. The 24" high transmitter can be located up to 2,000 ft. away. All outdoor components are corrosion resistant for long life & trouble-free, reliable operation. Uses "D" battery (not included) & comes complete with 60 ft. of weather-resistant cable. **No. 70,310 $255.00**

(B) Self-Generating Wind Speed Monitor

• Needs No Batteries Or AC Power Outlets
• Reads MPH & Knots

Use this attractive unit at home or on your boat. It measures wind speed from 0–100 mph and from 0–88 knots. Used by Alaskan fishermen for many years, this indicator keeps working, even under severe conditions. Kit includes an outdoor, self-contained generator for meter operation, a 12" mast, an indoor meter mounted in a wooden case, 60 ft. of connecting wire & instructions. **No. 72,131 $67.95**

(C) Remote-Reading Wind Speed Indicator

• Pneumatic Operation • 100% Wind Powered

Accurate enough for professionals, this completely pneumatic indicator out-performs many units priced well above its modest cost. Simple & reliable, there's nothing to adjust! Wind pressure aligns the rooftop vane causing pressure change which is transmitted through the connecting tube to displace red fluid on the easy-to-read indicator scale. Measures in both mph & Beaufort Scale. Kit includes attractive indicator, 50 ft. of flexible tubing, rooftop sensor/vane, mounting hardware & indicator fluid. Made of metal & sturdy plastic.
No. 71,931 $34.95

(D) Mobile Hand Anemometer

• 5 to 70 MPH Range
• Self-Contained With Built-In Compass

Perfect for weather study, boating, flying, farming & other outdoor endeavors, this compact 7½" high, lightweight unit is sensitive enough to catch a 5 mph breeze, yet rugged enough to read a 70 mph gale. Accurate to 3% of full scale, this self-contained unit requires no batteries, adjustments or recalibration. Built-in compass gives quick reading of wind direction. Ready to use anytime, anywhere! Has high impact, black plastic case with pistol grip & wrist strap. Marine bronze & brass used for all critical moving parts.
No. 42,547 $31.95

How Fast And Cold Is The Wind?

(E) 5-in-1 Weather Instrument

Shows wind direction and speed, registers temperature and records individual & accumulated rainfall for the week, month and year. Sturdy white plastic; 5 x 6". **No. 50,259 $5.95**

(F) Pocket Wind Meter

Know the wind speed instantly . . . anywhere! Has 2 scales—one is graduated 2–10 mph in ½ mph increments, the other from 10–66 mph in 2 mph increments. 1½ x 6⅝ x ⅝" thick. Weighs 2 oz. Case and instructions incl. **No. 60,349 $9.95**

(G) Electronic Windchill Gauge

This precision, calibrated unit determines the cooling effect of the wind on the outside temperature and its effect on your skin. It operates on standard 115 V AC and comes complete with mounting hardware. Attach to your antenna or mast. The monitoring unit mounts to any indoor wall so you can just glance at its easy-to-read dial and be prepared for the day's weather! 20 ft. of cable are included, but you can add up to 100 ft. without affecting the accuracy of the unit.
No. 72,412 $149.95

(H) Windchill Meter . . . Frostbite Alert

Know when the temperature & wind speed combine to cause frostbite conditions with this handy unit. Excellent for skiers, hunters or anyone exposed to cold weather. Battery included.
No. 42,631 $11.95

Windchill Factor Chart

Wind MPH	Temperatures						
	30	20	10	0	–10	–20	–30
10	16	2	–9	–22	–31	–45	–58
15	11	–6	–18	–33	–45	–60	–70
20	3	–9	–24	–40	–52	–68	–81
25	0	–15	–29	–45	–58	–75	–89
30	–2	–18	–33	–49	–63	–78	–94
35	–4	–20	–35	–52	–67	–83	–93
40	–4	–22	–36	–54	–69	–87	–101

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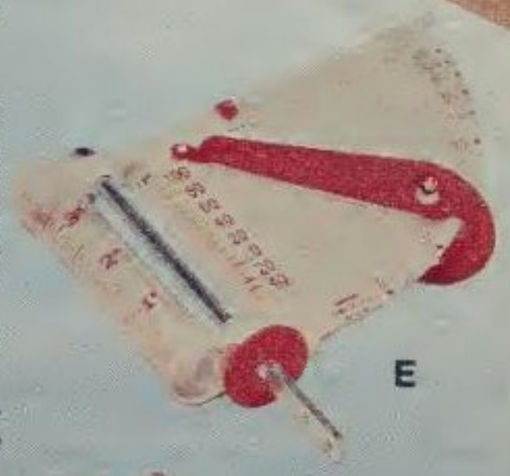

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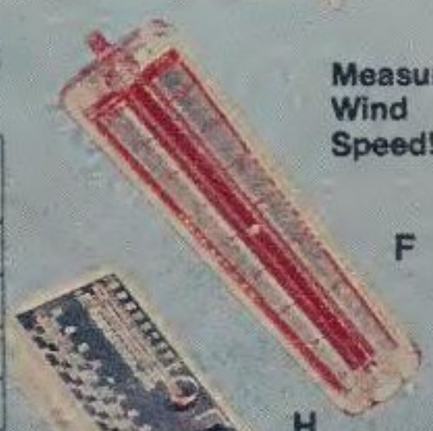

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Measure Wind Speed!

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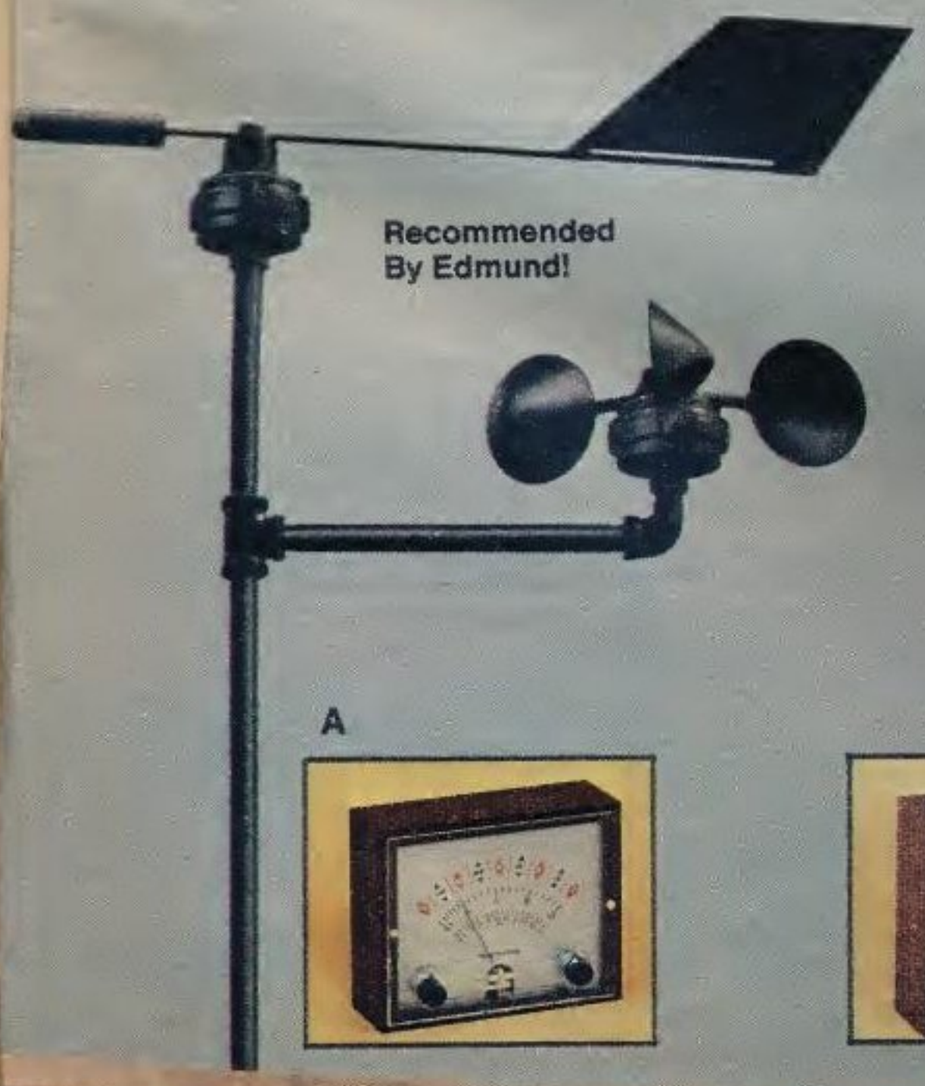
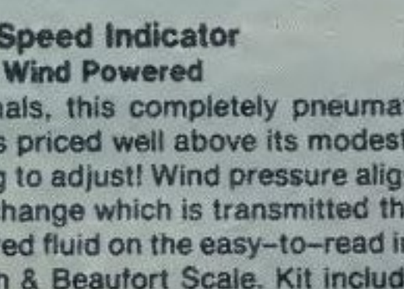
Avoid The Danger Of Frostbite!



Recommended By Edmund!



Wind Speed & Wind Direction Indicators . . .

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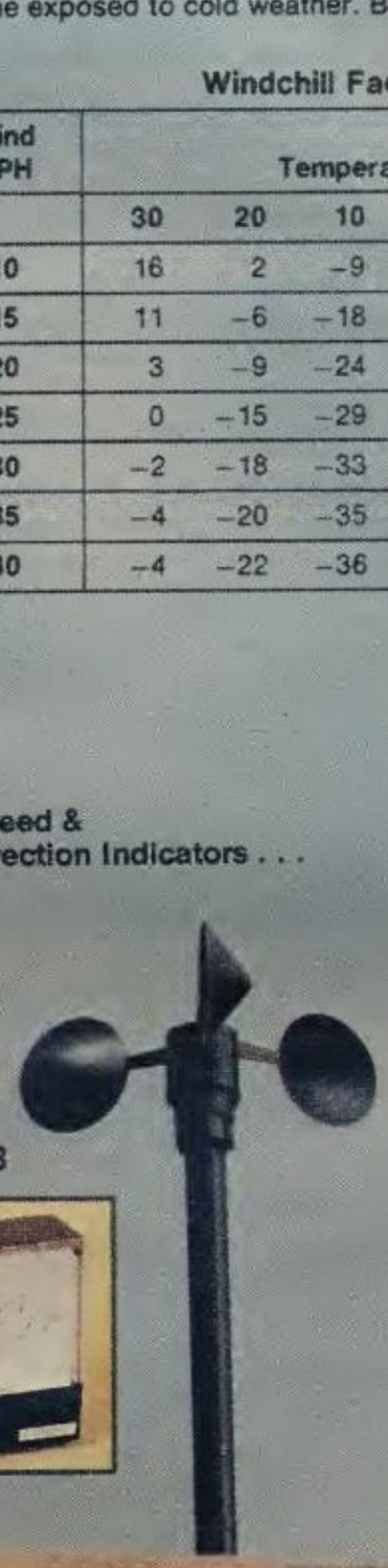

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Weather

**Stay Abreast Of The Weather . . .
Let Edmund Scientific Fill Your Weather Needs —**

(A) Forecast With Your Own Weather Computer

This professional instrument allows you to predict the weather 24 hours in advance when you use it with a barometer (not included). Predict the weather, wind speed & direction, temperature, cloud conditions & precipitation within a 30 mile radius. Includes a 28 page booklet with a circular plastic slide rule "computer" (programmed to over 5,000 variations of input), coded tables for interpreting data & complete instructions. Effective in all locations north of 25° latitude. Excellent for sportsmen, amateur meteorologists, anyone!

No. 61,061 $8.95

(B) Your Own Daily Weather Log

Each page lets you record temperature, humidity, pressure, wind clouds, etc. for 1 full year. Specially prepared weather resistant log contains explanatory information.

No. 9572 $5.95

What do weather conditions look like above the clouds? See page 90 for **"Meteorology Above The Clouds"** 35 mm slide set.

(C) "Whole Air Weather Guide" by Dr. Walter F. Dabberdt

Weather—everybody talks about it, but this book does more. It tells how & why. Elements are defined & their roles are explored. Provides forecast tips & a broad overview of conditions. 64 pp. Paperbound.

No. 9548 $3.50

(D) "Eric Sloane's Weather Book".

How weather-wise are you? It's always with us & come rain or shine, we have to get along with it! This book is authoritative yet entertaining, scientific while non-technical, factual but completely human in its approach to the explanations of weather's whims. 90 pp.

No. 9553 $3.50

Measure The Rainfall

(E) Digital Rain Gauge

• You Never Have To Empty It!

This battery operated weather wonder saves time & work for homeowners, farmers, students & amateur meteorologists. Measures rainfall in 1/10" calibrations to 99.9". Complete rainfall statistics for the hour, day, week or longer. Don't want to get wet? Take remote readings on the handy indoor counter. Reset button begins new rainfall calculation cycle. Operates for over a year on one 9 V transistor battery (not included).

No. 72,165 $49.95

One/Hundredth Calibrated System. Same features as above but with large collector; measures 1/100" to 99.99".

No. 72,319 $69.95

Extra Indicator Head. Record rainfall at different time periods, even year to date, while resetting one head after each rain. Use with No. 72,165 or 72,319 above. One gauge can drive up to three heads.

No. 42,559 $29.95

Low-Cost, Easy-to-Read Rain Gauge

Cone-shaped, clear plastic rain collector measures rainfall from 0–1.5" in 1/50" increments. Also measures 1.5–5.5" in 1/20" increments. Includes 2 mounts.

No. 71,439 $6.95

Tune In To The N.O.A.A. Weather Service

The U.S. Government's new radio network broadcasts the official weather news around the clock. 90% of the nation's population is covered by 350 transmitters. Now you can know what's happening before it's too late!

(F) Stormalarm . . . For Safety on Land & Sea

• Alarm Sounds When Conditions Are Dangerous

Tornadoes, hurricanes, severe thunderstorms & marine emergencies are constant threats to life & property. Stormalarm warns you of these conditions the way a smoke alarm warns you of fire. Unlike most weather stations that must be monitored, this one monitors itself. Triggered by a signal from the National Weather Service stations, it sounds a full blast in the event of emergency regardless of how low you've turned the volume. The alarm is followed by a full report. Completely portable, this unit has 3 channels that cover the nation, a 40–50 mile range, continuous beeper & flashing light that function until reset, 2¼" dia. speaker, 25" telescoping antenna, external antenna input, 115V AC to 9 V AC converter & 9V back-up battery. Instr.

No. 72,297 $59.95

(G) Storm Scan Alarm System

• Gives 20 Minute Advance Warning of Danger

Now you can receive advance warning of severe storms & tornadoes. The Storm Scan Alarm aids in protecting against disaster by giving at least 20 minutes advance warning of approaching storms. This is not a weather radio! Instead, it actually senses data directly from local storms by detecting electrical activity up to 30 miles away. Lightning lamp indicates electrical discharge in green flashes. Red "Burst" lamp indicates intense electrical activity. Meter also indicates storm intensity & will trigger audible alarm buzzer when danger nears. Battery operated.

No. 72,456 $89.95

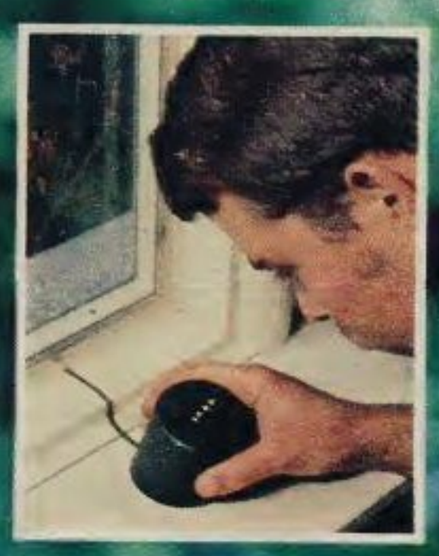
(H) Forecaster Weather Radio by Weatheralert™

Flip on the Forecaster when you need to know the weather—it's tuned in to the National Weather Service! Though it fits in the palm of your hand, this unit has ten times the pick-up power of ordinary forecasters and a 35–50 mile range. Has crystal-controlled switch-selectable tuning system, 2¼" full-fidelity speaker, 25" telescoping antenna, slide volume control. AC or DC operation.

No. 61,244 $34.95

Battery operated (only) Forecaster Weather Radio No. 72,328 $29.95

Recommended By Edmund!



Weather

Weather Stations For Scientific Monitoring

(A) The Edmund Deluxe Station

This station combines five quality weather instruments with our best forecasting materials. It permits you to make reliable readings of wind speed, barometric pressure, precipitation, temperature, humidity, cloud types & windchill. Kit includes wind speed indicator, rain gauge, holosteric barometer, thermometer, wet & dry bulb hygrometer, 372 page Daily Weather Log, cloud identification chart, pocket-sized wind chill factor chart & the U.S. Weather Bureau symbol key.

No. 80,216 $89.95

(B) Precision Electronic Weather Station

You don't have to wait for newspaper or radio reports of the weather. The Electronic Weather Station tells you what the weather is right now, anticipates what it's going to be tomorrow. Shows air pressure tendency by colored lights; thermometer, hygrometer & barometer have color-coded comfort range with aircraft instrument styling. Operates on standard 9V battery (not included). 7½" x 3½" x 2".

No. 42,724 $69.95

Decorative Weather Stations For Your Home

(C) Solid Walnut Weather Station

This handsome weather station is designed to mount on your wall while the weather tracking equipment mounts on your roof. Excellent for home, office, TV & radio stations. Features continuous remote readings of wind speed & direction, dial readings of barometric pressure, outside temperature & max/min temperatures, plus digital readout clock. White translucent dials, gold centers, black numerals. Includes roof cup & vane assembly, conductor cable, capillary wire & instructions. Panel: 17" x 12" x 3 3/16".

No. 80,280 $475.00

(D) Electronic Weather Station

This precision cluster of instruments registers up-to-the-minute weather conditions on one convenient console. Easily installed roof transmitter comes complete with lead-in cord. Measures wind direction & speed up to 100 mph. This professional looking instrument can be mounted or hung directly on the wall. Barometer indicates weather conditions 24 hours in advance. Thermometer & hygrometer register indoor temperatures & relative humidity. Operates on "B" battery (not included) and measures 17" x 12" x 3". Daily Weather Log & instructions included. Walnut & brass panel.

No. 80,218 $395.00

Build Your Own Weather Station

(E) Economy Weather Station Kit

Build a complete weather station that gives you the "know-how" to check your predictions against the pros of radio, TV & the Weather Bureau. Features remote reading anemometer with windvane & indoor indicator board that flashes neon lights to show wind speed & direction. All connections are safe. Powered by 115 V AC house current, it costs as little as a penny per month to operate. Kit includes sensitive air tank barometer with 2 ft. indicator column for checking air pressure, sling psychrometer to measure relative humidity, rain gauge with calibrated tube that measures as little as 1/100", 100 ft. of lead-in wire, color cloud identification chart & forecasting manual. Excellent for science projects!

No. 71,022 $27.95

Weather

Wind Speed And Direction Indicators

(A) Professional Monitor For Home & Work

• 2 Wind Velocity Scales For Accuracy
• Battery Operated • Corrosion Resistant

Perfect for wind monitoring at home, office, farm, marina & airport, this precision unit mounts on roof, flagpole, barn or antenna. Just use standard TV antenna mounting hardware. Easy–to–read indicator gives both wind speed & direction on one dial. 2 speed ranges: 0–25 mph & 0–100 mph. Only 6⅜ x 5⅛", the indicator's attractive mahogany finish mounts indoors & blends with any decor. The 24" high transmitter can be located up to 2,000 ft. away. All outdoor components are corrosion resistant for long life & trouble–free, reliable operation. Uses "D" battery (not included) & comes complete with 60 ft. of weather–resistant cable. **No. 70,310 $255.00**

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• Needs No Batteries Or AC Power Outlets
• Reads MPH & Knots

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(C) Remote–Reading Wind Speed Indicator

• Pneumatic Operation • 100% Wind Powered

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No. 71,931 $34.95

(D) Mobile Hand Anemometer

• 5 to 70 MPH Range
• Self–Contained With Built–In Compass

Perfect for weather study, boating, flying, farming & other outdoor endeavors, this compact 7½" high, lightweight unit is sensitive enough to catch a 5 mph breeze, yet rugged enough to read a 70 mph gale. Accurate to 3% of full scale, this self–contained unit requires no batteries, adjustments or recalibration. Built–in compass gives quick reading of wind direction. Ready to use anytime, anywhere! Has high impact, black plastic case with pistol grip & wrist strap. Marine bronze & brass used for all critical moving parts.
No. 42,547 $31.95

How Fast And Cold Is The Wind?

(E) 5–in–1 Weather Instrument

Shows wind direction and speed, registers temperature and records individual & accumulated rainfall for the week, month and year. Sturdy white plastic; 5 x 6". **No. 50,259 $5.95**

(F) Pocket Wind Meter

Know the wind speed instantly . . . anywhere! Has 2 scales—one is graduated 2–10 mph in ½ mph increments, the other from 10–66 mph in 2 mph increments. 1½ x 6⅝ x ⅝" thick. Weighs 2 oz. Case and instructions incl. **No. 60,349 $9.95**

(G) Electronic Windchill Gauge

This precision, calibrated unit determines the cooling effect of the wind on the outside temperature and its effect on your skin. It operates on standard 115 V AC and comes complete with mounting hardware. Attach to your antenna or mast. The monitoring unit mounts to any indoor wall so you can just glance at its easy–to–read dial and be prepared for the day's weather! 20 ft. of cable are included, but you can add up to 100 ft. without affecting the accuracy of the unit.
No. 72,412 $149.95

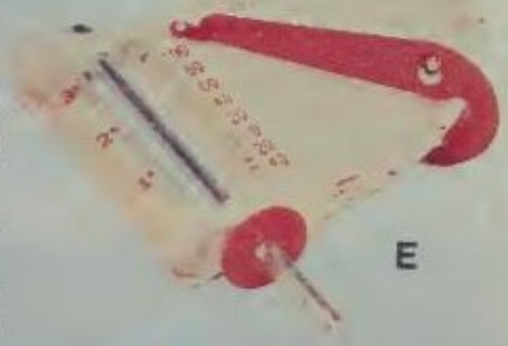
(H) Windchill Meter . . . Frostbite Alert

Know when the temperature & wind speed combine to cause frostbite conditions with this handy unit. Excellent for skiers, hunters or anyone exposed to cold weather. Battery included.
No. 42,631 $11.95

Windchill Factor Chart

Wind MPH	Temperatures						
	30	20	10	0	–10	–20	–30
10	16	2	–9	–22	–31	–45	–58
15	11	–6	–18	–33	–45	–60	–70
20	3	–9	–24	–40	–52	–68	–81
25	0	–15	–29	–45	–58	–75	–89
30	–2	–18	–33	–49	–63	–78	–94
35	–4	–20	–35	–52	–67	–83	–93
40	–4	–22	–36	–54	–69	–87	–101

D



E

Measure Wind Speed!

F

H

Avoid The Danger Of Frostbite!

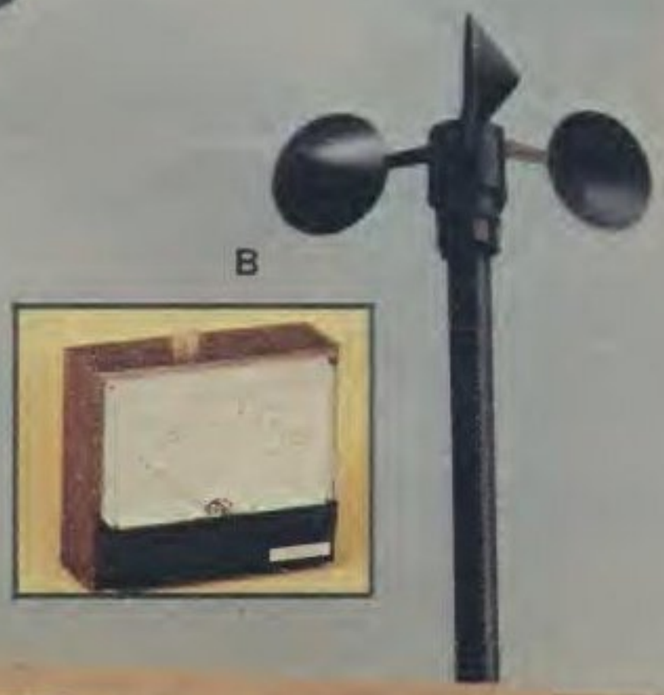
Recommended By Edmund!

G

Wind Speed & Wind Direction Indicators . . .

A

B



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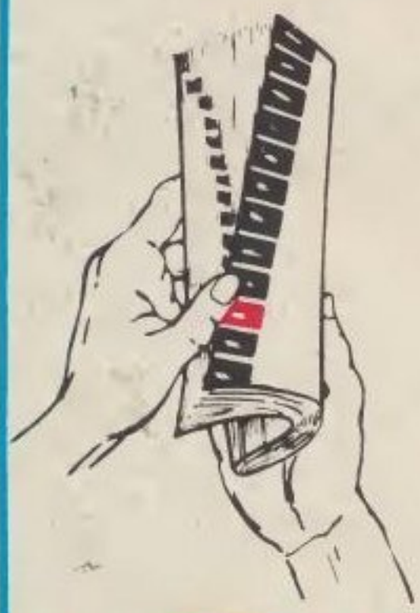

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